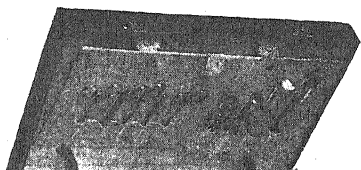




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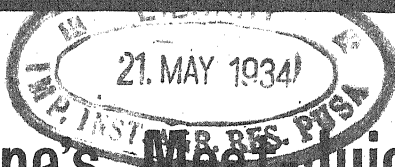
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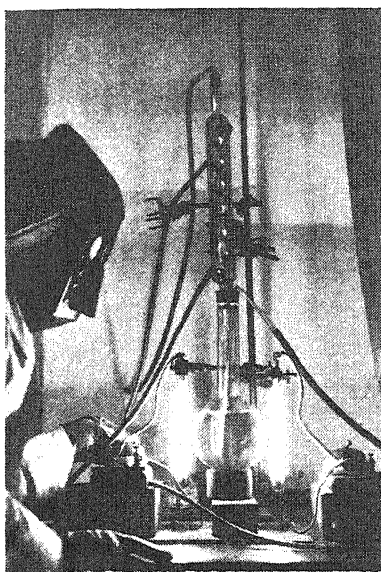
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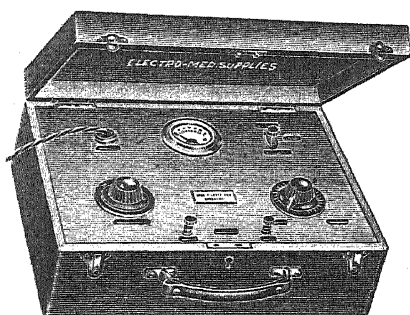
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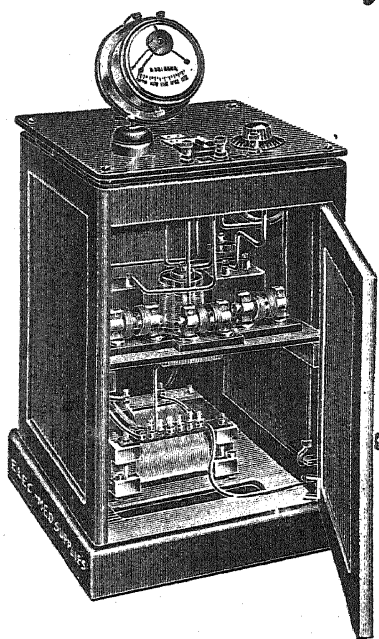
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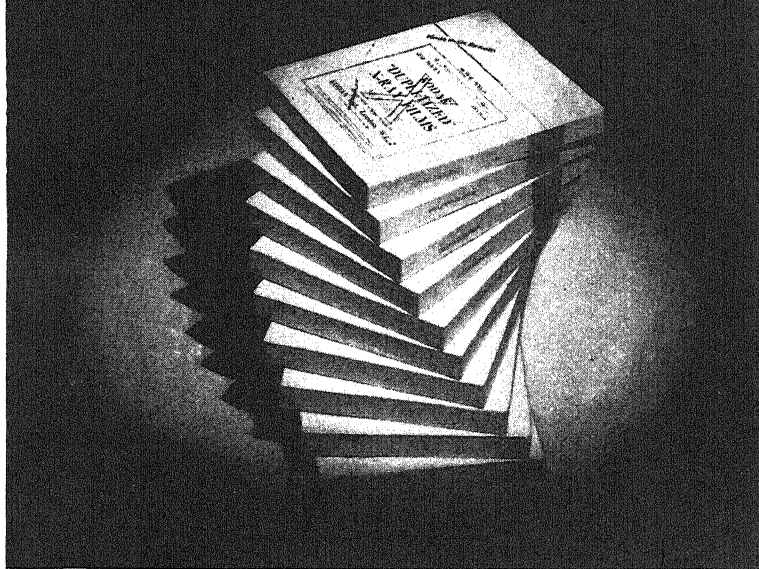
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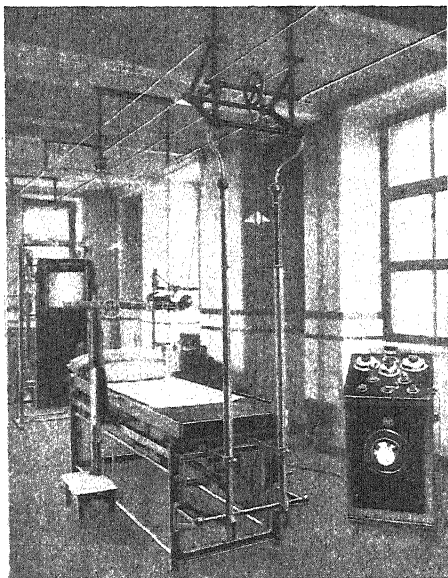
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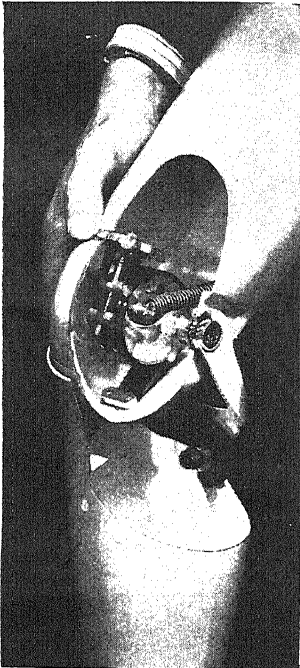
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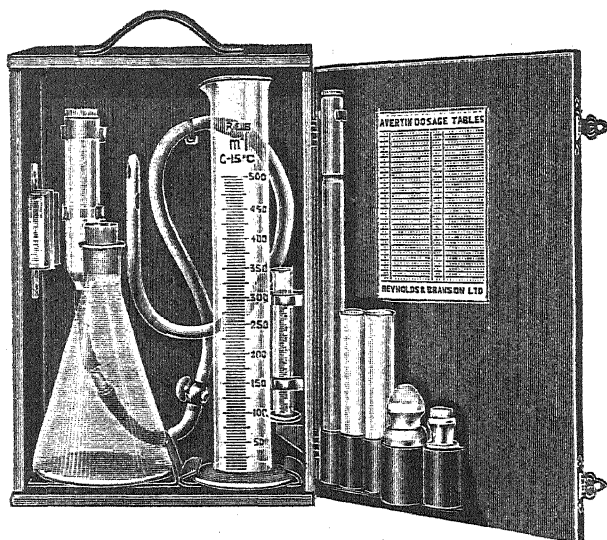
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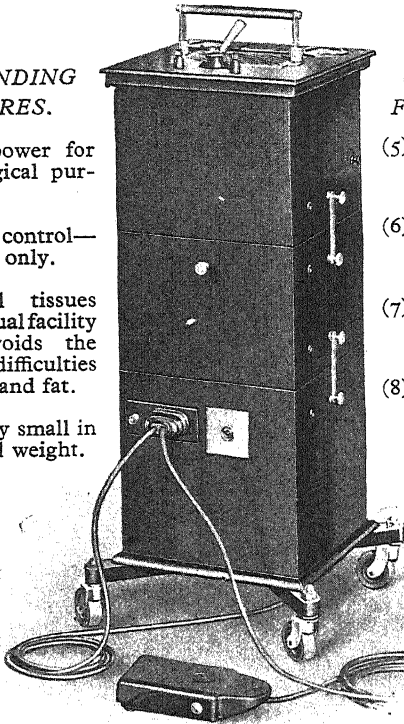
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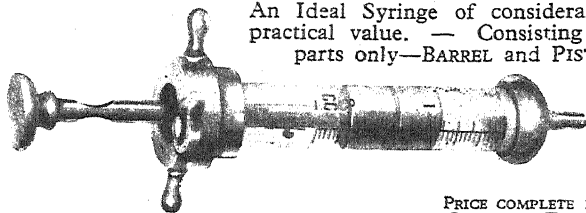


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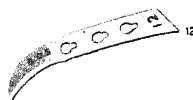
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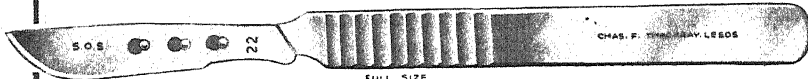


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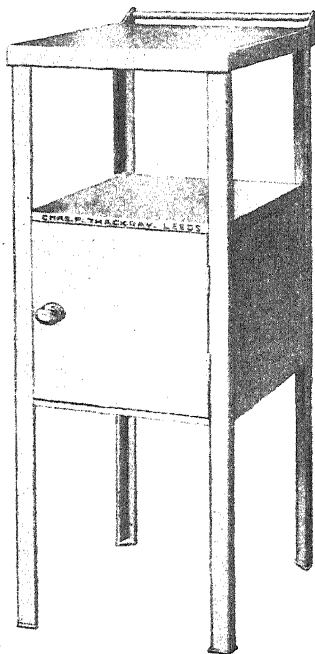
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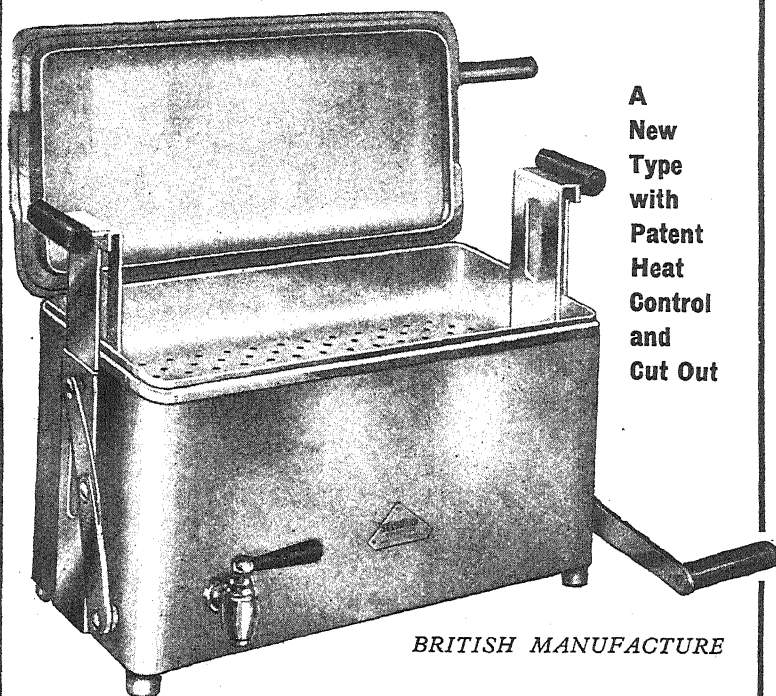
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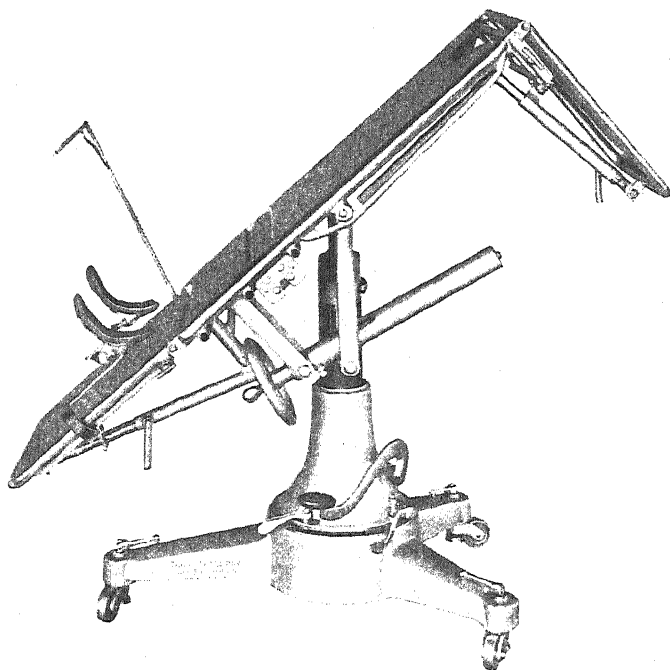
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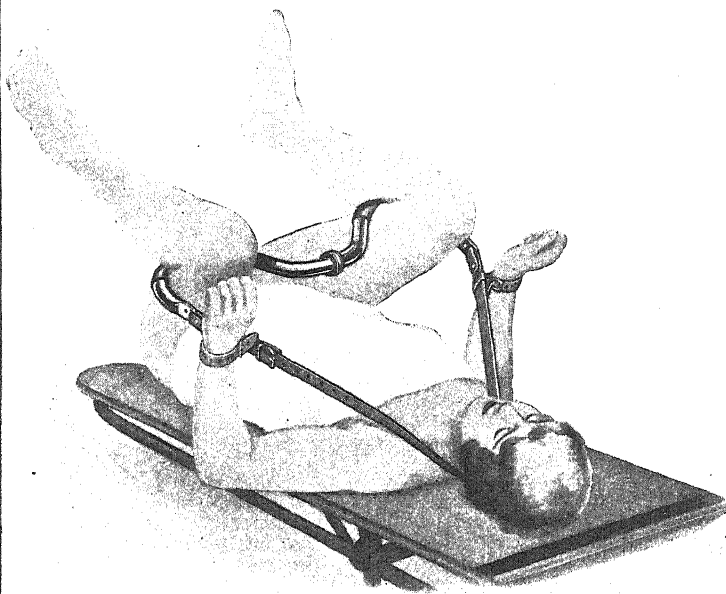
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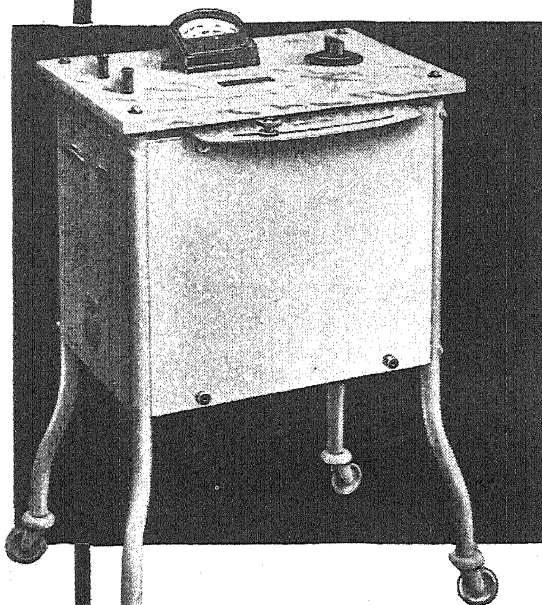
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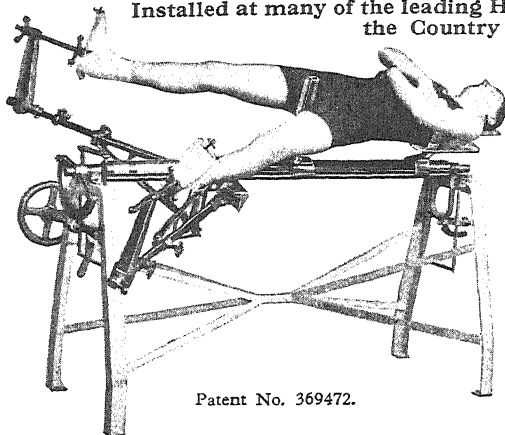
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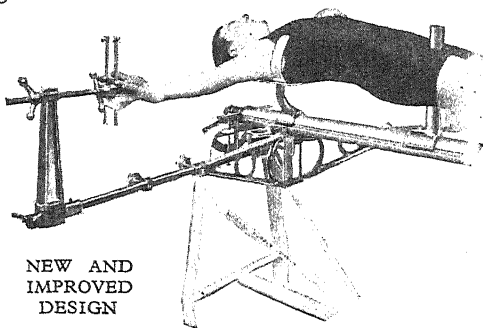
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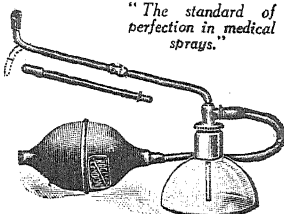
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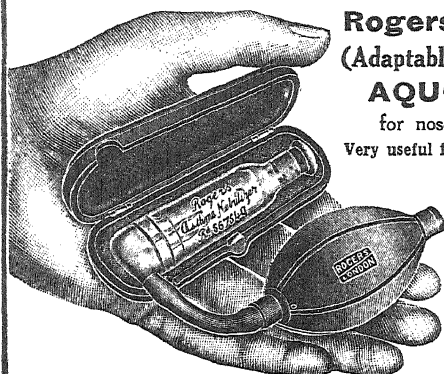
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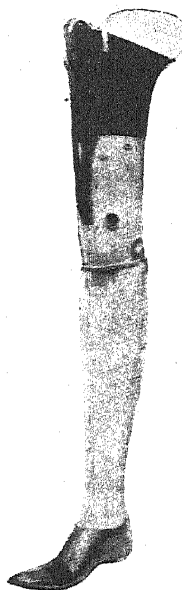
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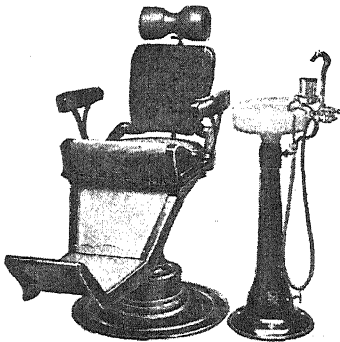
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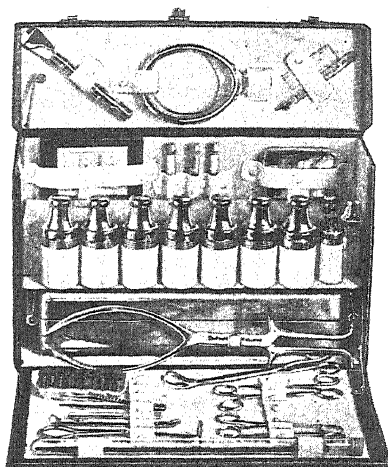
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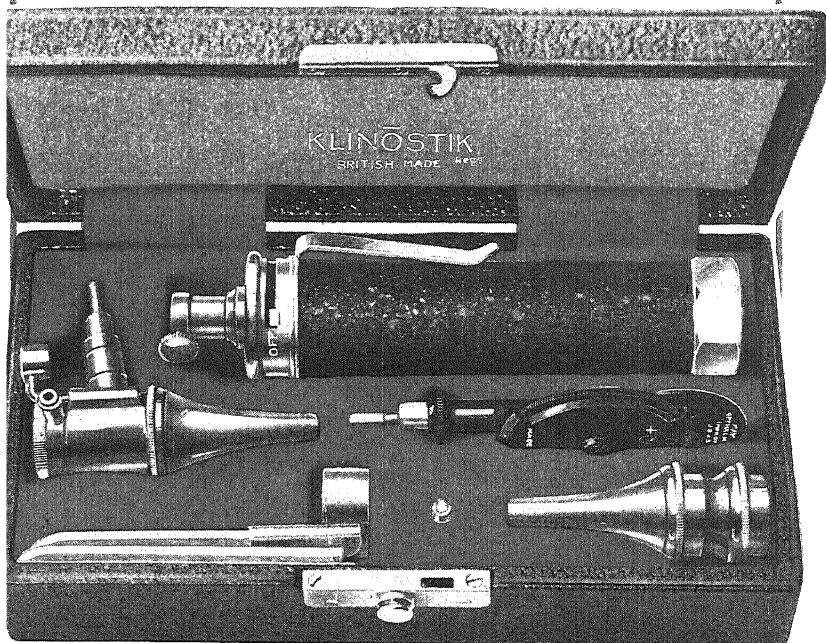
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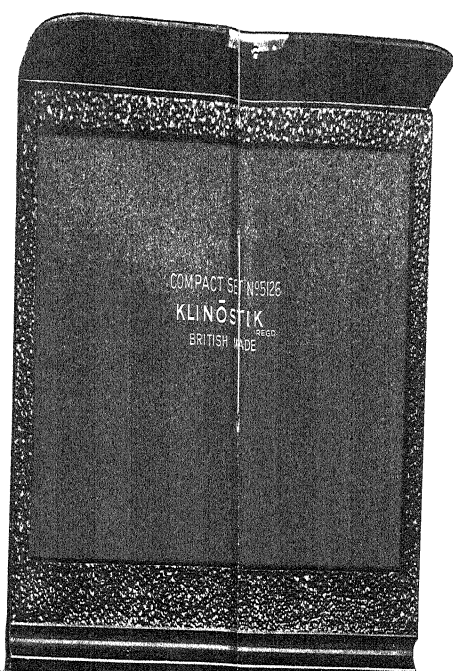
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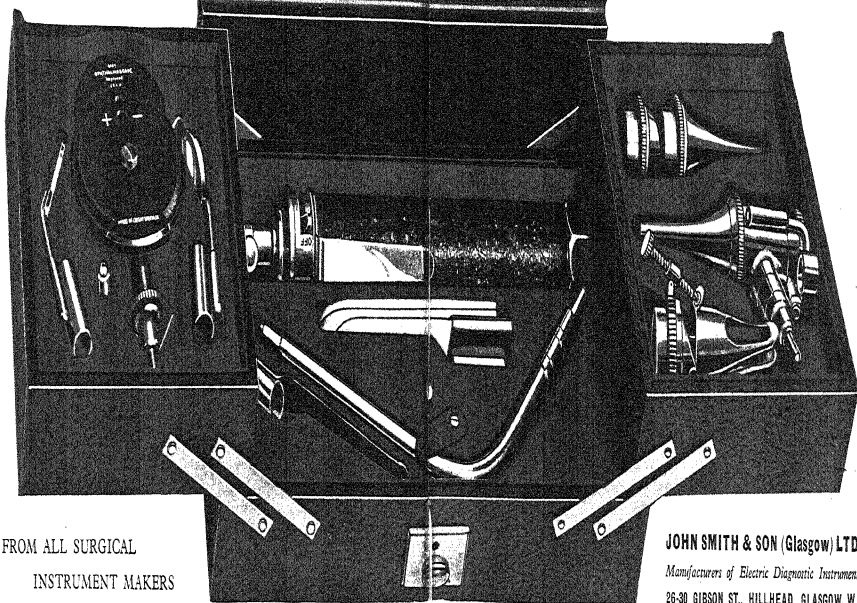


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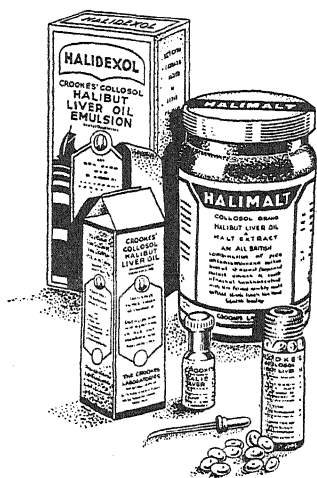
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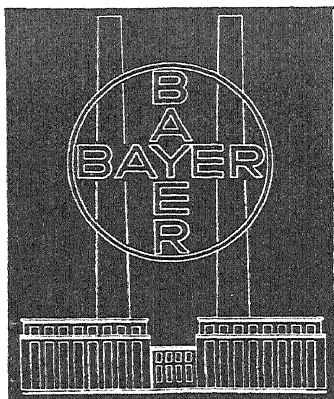
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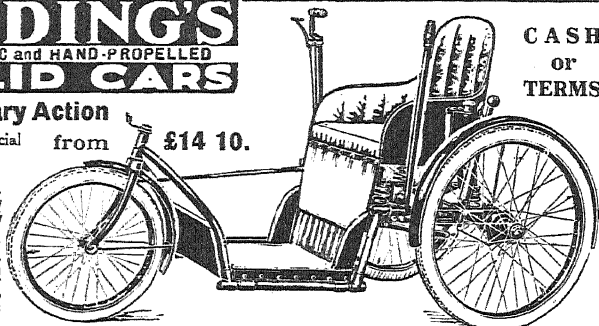
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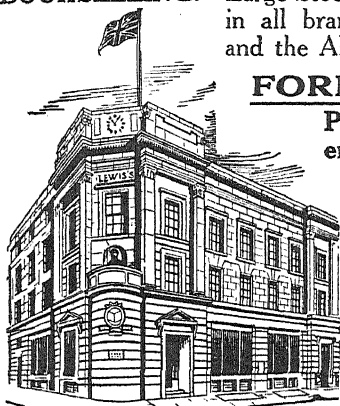
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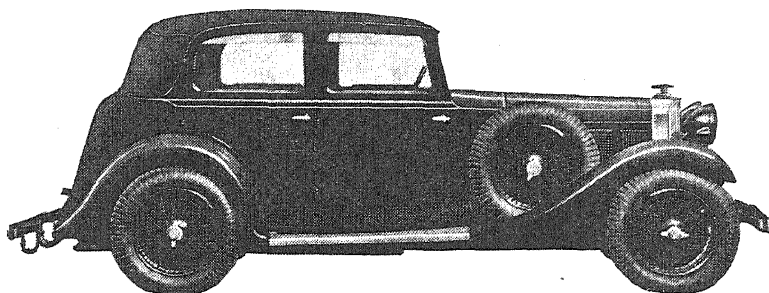
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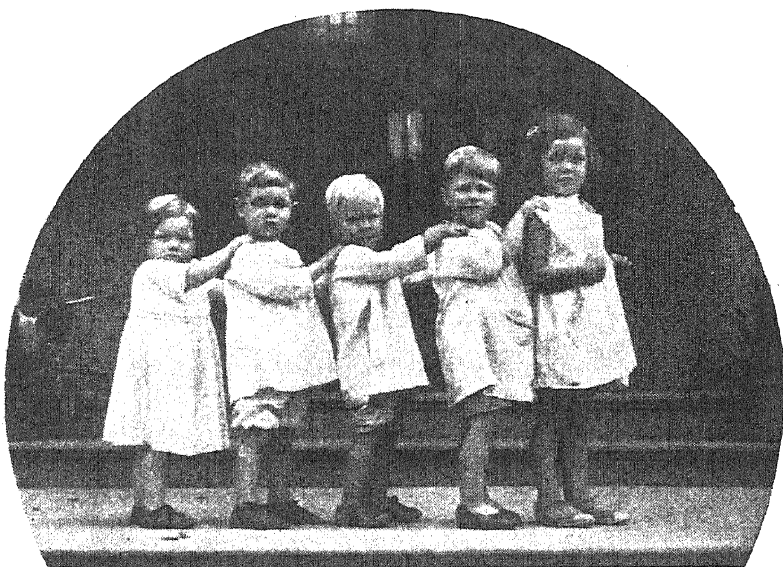
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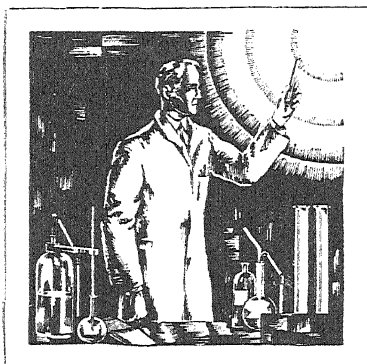
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THE MEDICAL ANNUAL, 1934

A Review of the Year's Work in the Treatment of Disease

INTRODUCTION

BY THE EDITORS.

REVIEWERS and critics are usually kind to the MEDICAL ANNUAL, for which forbearance the Publishers and Editors are grateful, but an occasional grumble is heard that there is too much for the specialist and not enough for the general practitioner, particularly in the way of simple methods of treatment. The reply is that this point has not been lost sight of. The MEDICAL ANNUAL is in the main, of course, a conspectus of current medical literature, and in this respect its contents are limited by what has been published, or has not been published, during the year. But careful consideration is also given each year to the selection and inclusion of special articles of practical value written independently of the literature. It is our constant principle never to pass over any new method of treatment that sounds at all promising. We venture to think that in the present issue a considerable number of therapeutic hints for the family doctor are to be found, and some of them are indicated in this Introduction. As has been explained in former years, the Introduction serves to indicate, in the least possible space, for the benefit of the most impatient reader, the new methods of diagnosis and treatment and the principal topics of interest that the year has produced.

MEDICINE.

NATIONAL HEALTH INSURANCE PRACTICE.—Under the National Health Insurance Act of 1911, there are now nearly 19,000,000 insured persons, and 19,000 doctors take part in their treatment. To the credit of all concerned this colossal business works with comparatively little friction. Nevertheless it involves much organization, and with this have grown up many complex details. Doctors entering on Insurance Practice find difficulties in mastering intricacies which are considered to be essential for its smooth progress. A special article from an experienced practitioner sets forth clearly many of these points and will be greatly welcomed.

MENTAL DISEASES AND PSYCHOLOGICAL MEDICINE.—The psychologists continue to pay considerable attention to the influence of infective toxic or metabolic disturbances in the production of psychoses. Some contend that a chronic focus of infection may be responsible for a sudden and acute psychosis. The question is of great importance, but must be protected from the risk of trivial defects being unduly exaggerated.

Conversely, it is emphasized that emotional disturbances can result in organic disease, e.g., disorders of the thyroid and suprarenal. One authority accepts the common belief that human hair has been known to turn white in a single night as the result of unusually severe emotional strain. The strict proof of this occurrence is still wanting, but the general principle is of greater importance.

Tests for drunkenness properly continue to be reconsidered. 'Drunkenness in charge of motor cars' has introduced a new standard and increased difficulties. A thoughtful article by an experienced practitioner is reviewed at length.

STAMMERING.—Stammering can reduce the school life of a sensitive child to one long misery and anxiety. In adult life, it is embarrassing alike to the stammerer and his audience, and it is a serious handicap in most occupations. Formerly the treatment was conducted on empirical grounds, but more recently it has been studied scientifically, and the results are excellent in skilled hands. An article explains the basic difficulties of the stammerer and the method by which he can be taught to circumvent them.

SKIN DISEASES.—The use of cosmetics is almost universal, is dictated by fashion, and in general is pleasing to the eye. It is obvious from their widespread use that most of them can be safely employed over long periods. Ill effects mainly occur to those who ask too much from them. The importance of such ill effects is that they tend to produce unsightliness in those who are especially anxious to avoid it. Several difficult law-suits have been the result. A review is given of recent articles on their dangers.

DIETETICS: VITAMINS.—In recent years the study of vitamins, diabetes, and liver diet in anæmia has resulted in attention being drawn to what were formerly considered as unimportant details of diet. So carefully are diets now constructed that hospitals need special kitchens and special departments to deal with them. The subject of dietitians is dealt with in the article on dietetics. In the article on pyelocystitis there is an example of modern dietetic methods in a review of the ketogenic diet treatment. A lengthy summary of recent work on vitamins is given by our reviewer. The general principles of vitamins are fairly established, but it is now becoming recognized that details are of great importance in dealing with substances of which the presence or absence in minute quantities in the diet can produce such enormous results in vast populations.

TROPICAL DISEASES.—Malaria is one of the most important diseases in the world. The search still continues for a drug with a more potent effect than quinine on the sexual stages, especially of subtertian malaria. The favourable reports on atebirin in previous years are supported by recent records. It appears to be most efficacious when plasmochin is administered subsequently. With these two drugs, the number of relapses is undoubtedly less than with quinine.

The etiology of pellagra still defies the complete elucidation which on several occasions has appeared to have been achieved. The field is, however, gradually narrowing. Goldberger's pellagra-preventive vitamin, or 'P-P factor', is now shown to be identical with vitamin B₃. Deficiency of vitamin B₂ cannot be the sole factor in the causation of pellagra, since it is present in high amount in maize, the consumption of which is undoubtedly connected with pellagra.

Tropical typhus has now been found to be an extensive group of diseases. Fortunately, it does not produce epidemics, as it does not spread from man to man. The complex but interesting studies now in progress are summarized by the reviewer.

Further studies are recorded on the vexed question of the relationship of yaws to syphilis. The authorities appear to be inclining more and more to the acceptance of their identity.

ACUTE INFECTIOUS DISEASES.—The bacteriology of influenza has defied the efforts of researchers over the whole world, a fact which always surprises the layman and is regarded as a great discredit to the medical profession. Investigations are hampered by the immunity of animals. It has now been discovered that the disease can be transmitted to ferrets, and the infection maintained by contact from ferret to ferret. The infection is distinct from that of a common cold. It may be hoped that this great advance will be followed by further progress.

Spirochætal jaundice is reported from various parts of the Continent, especially from Holland. There is still confusion as to whether the term 'Weil's disease' is synonymous with spirochætal jaundice, or includes all forms of epidemic jaundice. It is frequently used in the former sense, but the latter would appear to be historically correct.

The fact that the small-pox at present prevailing in this country is universally of the 'mild' type is emphasized by the opinion expressed by a responsible authority that the benefit to public health from indiscriminate hospital isolation of small-pox is not commensurable with the expense involved. Such a statement would have amazed the last generation.

GASTRIC AND DUODENAL ULCER: ALKALOSIS.—The treatment of peptic ulcers with large doses of alkalis has been widely practised since its introduction by Sippy. Occasionally alkalosis develops, and the reviewer quotes the symptoms from a recent careful study. The picture is somewhat terrifying, but fortunately rarely occurs, is easily recognized, and readily cured if alkalis be withheld.

INSOMNIA AND THE USE OF HYPNOTIC DRUGS.—Insomnia is a terrible factor in the lives of many people, and lurks as a frightening spectre round the beds of many others. So often it hits just at the time when "tired Nature's sweet restorer" is most urgently required. The fear of hypnotic drugs is also very general. No doubt this dates from the period when opium was the only potent sleep-bringer, and before Emil Fischer had discovered veronal and started the long train of barbitone derivatives. The subject is dealt with in a special article.

DISEASES OF THE HEART AND BLOOD-VESSELS.—In last year's MEDICAL ANNUAL a research was reported indicating that an electrocardiogram of low voltage was of very serious import. This view has been further studied during the past year. The general principle is accepted with modifications in certain circumstances.

The relationship of hyperthyroidism to cardiovascular disease continues properly to attract attention, and several important articles are summarized. The prognosis in cardiac disease due to thyrotoxicosis has been the subject of detailed consideration. The general principles are gradually emerging year by year.

Several articles on pericarditis have appeared recently. The subject has not received much attention of late. In view of the great seriousness of the affection, it may be hoped that some benefit will result from its further consideration.

DISEASES OF THE NERVOUS SYSTEM.—Spontaneous subarachnoid hemorrhage existed in text-books for many years as a rare condition with an obscure symptomatology. Clinical and pathological studies have proved that it is comparatively common and has an easily recognized picture. The diagnosis can now be made with fair certainty on clinical grounds. The etiology is wrapped up with obscure questions of cerebral aneurysms. It has recently been suggested by Volhard that the neurological manifestations in certain types of uræmia are due to disturbances of the cerebral circulation and not to retention of nitrogen and various metabolic products. The literature has increased rapidly in support of the theory. The reviewer discusses these matters in the articles on cerebral aneurysms and on cerebral apoplexy.

One of the most important and interesting communications of the year comes from the Royal Army Medical Corps and emphasizes the influence of cysticercus infections as a cause of adult epilepsy. The investigation has been carried out most carefully, both clinically and pathologically. It needs close attention from those practising abroad. The subject is reviewed in an article on epilepsy.

Migraine has always laid a heavy hand on the intelligentsia, and many distinguished members of the medical profession have been life-long sufferers. It is now recognized that numerous widely-differing conditions may be primary factors. Chronic duodenal ileus was found some years ago to produce its features. Yet the cause of many attacks remains obscure. The problem is being attacked rightly from different aspects and there have been numerous communications in the past year, though no great addition has been made to our knowledge.

The use of the Drinker Respirator was given considerable prominence in the lay press a few months ago. The need for this expensive and complicated apparatus is not likely to be extensive except in the case of a special epidemic of poliomyelitis. There is no doubt that it may occasionally save a life which would otherwise certainly be lost, and practitioners should be acquainted with the circumstances in which it is of use and how it can be obtained. Recent literature is reviewed in the article on poliomyelitis.

ENDOCRINOLOGY.—Study of numerous syndromes attributed to diseases of the pituitary body has been stimulated afresh by Cushing's fascinating writings on basophil adenomata. The degree of influence of the adrenal glands in this syndrome is still uncertain, but would appear to be closer than Cushing believed. Simmonds' disease is also recognized to be by no means rare, and numerous cases have been reported and studied. The pituitary can scarcely be studied without considering the sex hormones, with which it is closely linked in many syndromes. Here, again, there has been a steady advance. The preparation of oestrin in a pure crystalline form has opened the path to exact determinations in some directions.

ASTHMA.—There appears to have been little advance here. There is much discussion, with little solid basis, for and against the numerous methods of treatment which are being suggested, and which cause so much ill-founded optimism among the unfortunate sufferers who are so readily persuaded to adopt them.

CHRONIC RHEUMATIC DISORDERS.—Rheumatic disorders are now attracting world-wide attention. They are said to hold first place as a cause of ill-health under the National Insurance Act. Our own country

has consequently been prominent in the recent literature. Unfortunately, many bodies and authorities who should know better have neglected the advice given by the Royal College of Physicians in their Nomenclature of Disease that "the term 'Rheumatism' should not be used without qualification". It is by no means always clear what clinical condition is being referred to. The late Dr. S. T. P. Strangeways spent his life in the study of diseases of bone. His collection has been the subject of a special study. The report of the Arthritic Committee of the British Medical Association may be regarded as expressing views widely held in the medical profession in this country. The reviewer gives a summary of these views. The literature in this group is enormous, and the reviewer refers to sixty-eight articles.

ANÆMIA.—Anæmia in childhood defied all attempts at classification until the recent advances in the knowledge of megalocytosis and microcytosis had cleared the air to some extent. Much useful work has been done in the last year, and several lengthy and important articles are summarized by the reviewer. The value of blood transfusions is being increasingly recognized.

Pernicious anæmia and megalocytosis has again been the subject of important advances in knowledge. These are from many aspects rather than from any one dramatic discovery.

SURGERY.

GENERAL SURGERY.—Our reviewer expresses the opinion that the Sylvester method of artificial respiration is not suitable on the operating table; much better is direct inflation by blowing through the face-piece of a gas or ether inhaler. Bennett's fracture of the thumb is a little injury often badly treated; it is best to reduce the deformity and put up abducted in plaster. The tannic acid treatment of burns can be improved by adding a little acriflavine, and by over-painting the dried surface with collodion; a method using a gauze dressing soaked in tannic acid and perchloride of mercury is recommended for the casualty room and the doctor's surgery for minor cases of burns. A method of excising corns with the aid of a local anæsthetic deserves to be used more frequently than it is. The common condition called ganglion is often troublesome to excise; it can be cured by injecting collodion.

ABDOMINAL SURGERY.—The abdominal surgeon may be interested in a description of the use of diffusion anæsthesia along with the injection of percaïne in the perivascular plexuses as a means of rendering the viscera insensitive. Continuous intravenous saline injection is regarded by many who have used it as a very valuable life-saving measure in critical abdominal cases. Several writers advocate a two-stage operation, ileocolostomy followed by hemi-colectomy, as the best treatment for cancer of the cæcum and ascending colon. We are informed that the blood-coagulation time is nearly valueless as indicating whether a jaundiced patient will bleed, but a rapid sedimentation rate forewarns us of trouble. An interesting method is described of ascertaining the condition of the bile-passages at operation by means of lipiodol and X rays. Removal of a suprarenal gland may cure patients with threatening gangrene of one limb after another. The strange discrepancy between the results of gastro-jejunostomy for ulcer in Central Europe and in this country appears to be largely explained by the discovery that on the

Continent ulcers are usually associated with a marked gastritis with a tendency to secondary ulceration. The X-ray diagnosis of intestinal obstruction, by examining the patient both recumbent to show gas-patterns, and standing to show horizontal fluid-levels, is becoming recognized as of real value. A very good account is given of rupture of the pancreas, and the importance of operating in the period of quiescence, after shock passes off and before a tumour-mass forms, is pointed out. The condition of hypoglycæmia, due to too much insulin-secretion from the pancreas, is recognized, and can be treated by resection of adenomata in the pancreas. Lymphosarcoma of the abdomen responds well to X-ray therapy.

GENTO-URINARY SURGERY.—Cystoscopy may be performed painlessly by using a very small low spinal injection of stovaine. A new treatment for nocturnal enuresis is recommended—the perineal injection of normal saline. Post-operative retention of urine may yield to large doses of potassium acetate by mouth. The partially paralysed bladder can be restored to function by excision of the presacral nerve. Good results are reported from the intravenous injection of calcium chloride in the treatment of gonococcal epididymitis. Coffey has improved and simplified his method of anastomosing the ureter to the colon. Neotropin is well spoken of as a urinary antiseptic, and a ketogenic diet appears to be useful for kidney infections. Acid ammonium phosphate and chloride acidify the urine better than sodium phosphate. Some of the best figures for prostatectomy that have been published come from Sydney, the method used being to reconstruct the floor of the prostatic urethra and close the bladder; it may be that this will prove to be a very substantial advance.

SURGICAL DISEASES OF CHILDREN.—The review of the surgical treatment of children's diseases discusses the operation for double hare-lip, and advises non-interference with the projecting pre-maxilla. A muscle transplant operation is described for cleft palate. By sufficient pre-operative treatment the mortality of operation for congenital stenosis of the pylorus has been brought down to 2 per cent.

RECTAL SURGERY.—Epithelioma of the anus responds better to radium than to resection. The troublesome little condition called coccygeal or pilonidal sinus is difficult to cure; it may be excised completely, or treated by injection of caustics (for formula see the article on 'Cysts and Fistulæ').

SURGERY OF THE NERVOUS SYSTEM.—As usual, the surgery of the nervous system provides plenty of new suggestions. A few cases are recorded in which apoplexy (cerebral hæmorrhage) has been operated on with success. Abscess of the brain can be dealt with much more successfully in the late than in the early stages and it is often wise to wait for encapsulation to take place. Paralysis of the facial nerve has usually been treated by nerve anastomosis, but recent experience shows that a graft to bridge the gap may be successful. Trigeminal neuralgia may be treated by alcohol injection or by division of the sensory root of the fifth nerve, either by the temporal route or through the cerebellar fossa; in the hands of experts either method is now very safe, with a mortality under 1 per cent. The distressing vertigo of Ménière's disease can be cured by dividing the eighth nerve intracranially.

THORACIC SURGERY.—The best treatment for abscess of the lung is often 'bronchoscopic aspiration'. Tuberculous empyema should be aspirated, or the cavity obliterated by multiple-stage thoracoplasty; if it is secondarily infected, closed drainage with repeated irrigation is best.

SURGERY OF THE BONES AND JOINTS.—Several points with regard to the surgical treatment of bones and joints call for comment. Tuberculous hip used to be treated by excision; then conservative, non-operative treatment had a long reign; now there is a tendency to return to operation in certain intractable cases, and particularly in adults; the operation may be an extra-articular fixation, or a modified excision. Tuberculous knee in patients above the age of nine also is probably better treated by arthrodesis; certainly this is true in adults. The troublesome ailment called 'tennis elbow' really covers two quite separate injuries: the one is an arthritis or internal derangement of the radio-humeral joint, and the other a fibrositis-periostitis of the origin of the extensor muscles; in the former case rotation is painful, in the latter it is not; in early cases rest on a splint is essential and massage does harm; in the late cases a little operation to remove periosteal thickening is advised. In the treatment of open fractures, opinion seems to be settling down in favour of the Winnett Orr method (wound cleansing, open vaseline pack, perfect alinement and fixation by pins, closed plaster case). There is a note on the causation and treatment of a little ailment troublesome in general practice, namely, painful heels; deep X-ray therapy is said to give good results. A simple and effective remedy to be given by mouth for staphylococcal infections would be a great boon, and in the opinion of some this is to be found in stannoxyl.

VENEREAL DISEASES.—Under the title of 'the sixth venereal disease' the condition known as lymphogranuloma inguinale has attracted much attention, and there is now a skin reaction (Frei's test) for it; this shows that esthiomène, climatic bubo, and many cases of stricture of the rectum in women, are all due to lymphogranuloma inguinale; evidently it is a disease that deserves serious notice. Some discussion is reported as to whether syphilis is or is not dying out; probably in this country it is. There is evidence that late neuro-syphilis is more likely to occur in cases that have been treated by arsenic preparations alone than in those who had a heavy metal as well. Arsphenamine poisoning may be relieved by injections of sodium dehydrocholate.

ANÆSTHESIA.—We have again to call attention to remarkable activity amongst the anæsthetists. A new drug for intravenous injection, evipan-sodium, is safe and reliable for short operations. Sodium soneryl, given by mouth, is said to be a safer pre-anæsthetic medicament than nembutal. For many types of operation, especially on the upper abdomen, it is better and safer to inject the spinal anæsthetic not into the theca, but extradurally, though it is not entirely easy to place it correctly.

EYE DISEASES.—The importance of pre-operative care has impressed the ophthalmologists, as well as their brethren the general surgeons. Before removing a cataract a bacteriological examination should be made, and if harmful organisms are found, the operation is postponed and the conjunctival sac treated; if diabetes is present it should be controlled first. Of various ways of securing quiescence of the orbicularis

muscle during the operation, probably the best is to inject novocain into the branches of the facial nerve in front of the ear; with the extracapsular extraction, the iridectomy should not be performed until the lens has been expressed. We now know that even severe cases of ophthalmia neonatorum are often due to other germs besides the gonococcus. Silver nitrate is not a safe prophylactic; protargol or argyrol is better. In treatment, eusol and acriflavine are preferred, and an intramuscular injection of milk is often very effectual.

EAR, NOSE, AND THROAT DISEASES.—In an article on the treatment of tuberculosis of the larynx, reference is made to the importance of early diagnosis, which depends on examination signs, not on symptoms; it is by no means a hopeless condition; gold-salt treatment, electro-cauterization, voice-rest, and the local application of ultra-violet light rays are well spoken of; pain, chiefly in the early morning, may be relieved by the simple procedure of gargling with warm sodium bicarbonate solution. Meningitis of otitic or nasal origin may recover after the intrathecal injection of air, which appears to promote free drainage. An important paper has been published in Stockholm on tumours of the upper jaw and ethmoid; the results of treatment are by far the best yet put forward; the method followed has been excision of the growth by diathermy.

GYNÆCOLOGY AND OBSTETRICS.—Our reviewer calls attention to the good results obtained by treatment with radium or X rays for hæmorrhage at the menopause; some prefer one, some the other; the use of radium by those who lack the necessary experience may lead to a crop of unpleasant sequelæ, and even the expert has trouble at times; for instance, permanent amenorrhœa may be induced in young women. Much attention has lately been paid to the rearing of premature infants; great care must be taken to maintain a *constant* high temperature, as by means of an electric blanket; a common error is to kill the child by overfeeding.

RADIOLOGY.—The article on X-ray diagnosis calls attention to the value of skiagrams to the obstetrician in judging the size and shape of the mother's pelvic canal, and the size and position of the fœtus. The cause of low lumbar backache may be elucidated by the X-ray demonstration of an apical abscess at the root of a tooth, causing septic absorption. The intravenous injection of thorotrast is relied on by some as a means of rendering the liver and spleen visible in the skiagram, but it is doubtful if the method is safe. Leukæmia may respond well to X-ray treatment, but the dosage must be very small at first. In a special article on radium treatment of cancer we are told that this is concentrating principally on growths of the mouth, breast, and uterus; in many general hospitals it is now more frequently used than the scalpel for these conditions, and the final results appear to be better. It is now recommended not to remove the gland-bearing area in the neck, if no palpable enlargement can be felt, in patients treated by radium for cancer of the mouth, but radiation is desirable. A case is reported in which it would appear that a lost radium needle eventually started a malignant growth.

In these days when the output of medical literature in all countries is so enormous, some of it excellent, some of poor quality, we are the more grateful to our sectional contributors, who bring their special skill and experience to the task of giving us a summary of the best.

DICTIONARY OF PRACTICAL MEDICINE

BY MANY CONTRIBUTORS.

ABDOMEN, INJURIES OF.*A. Rendle Short, M.D., F.R.C.S.*

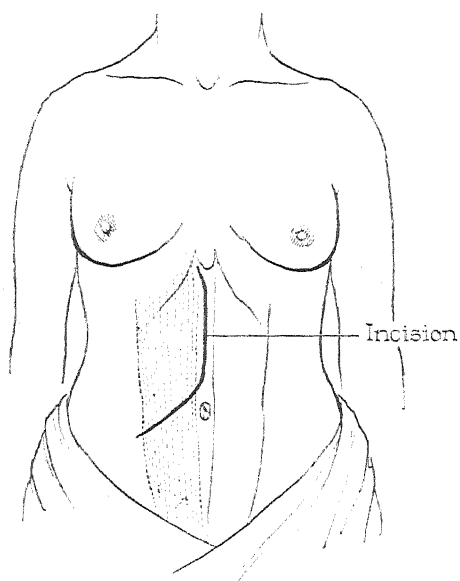
Gunshot Wounds.—A number of American authors, including B. C. Willis,¹ J. D. Martin,² and F. L. Loria,³ write on this condition, with which they are more familiar than we in this country during time of peace. The main points that emerge are the following: Gunshot wounds are much more fatal than penetrating stab-wounds; the death-rate amongst patients reaching hospital is from 35 to 60 per cent. A main cause of death is intraperitoneal hæmorrhage, and blood transfusion may be life-saving. Pistol- and rifle-shot wounds call for operation to locate and close holes in the intestines. Shotgun injuries with multiple retained pellets ought to be let alone, as the holes are too tiny to do much harm. All patients should be given intravenous glucose and saline, warmth, nothing whatever by mouth, liberal morphine, and injections of antitetanic and *perfringens* serum.

REFERENCES.—¹*Ann. of Surg.* 1932, Aug., 161; ²*Amer. Jour. Surg.*, 1933, July, 17; ³*Ann. of Surg.* 1932, Aug., 169.

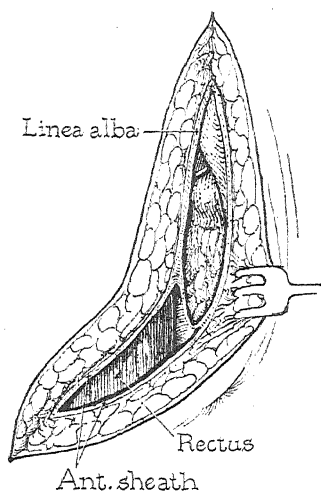
ABDOMINAL SURGERY, MISCELLANEOUS.*A. Rendle Short, M.D., F.R.C.S.*

Incisions and their Closure.—After discussing the incisions commonly used, and pointing out the importance of getting a good exposure, avoiding intercostal nerves, and preventing post-operative hernia, A. D. Bevan,¹ of Chicago, describes a method of approach for the gall-bladder which is sufficiently shown by *Fig. 1*. A similar incision may be used for splenectomy. In closing he uses a few long tension sutures, biting the skin, fat, and anterior sheath of the rectus, passed through the two eyes of a pearl button and tied. Metal clamps should not be used to close the skin in abdominal incisions, because in some cases where the wound has opened up, some of the clamps have been lost in the eviscerated intestines and omentum and have even produced intestinal perforation and death. [What a melancholy sequence!—A. R. S.] Bevan very rightly advises an oblique incision, parallel to the nerves, for operations on the right or left colon.

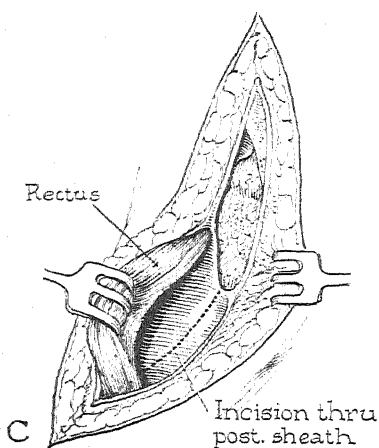
W. and W. Bartlett,² of St. Louis, argue in favour of transverse incisions in the upper abdomen, giving the following advantages: (1) Injury to the nerve-supply is avoided; (2) The posterior aponeurosis of the muscles, the main supporting structure in the upper abdomen, is split parallel with the direction of its fibres; (3) Intra-abdominal exposure is greatly improved, necessitating far less packing, handling, and retraction of viscera; (4) Closure is always facilitated; (5) Post-operative course in the hospital is distinctly smoother, with noticeably less tendency to vomit, little pain on respiration, and shorter confinement to bed, with consequent economic gain; (6) There is suggestive evidence that the risk of respiratory complications is less; (7) Decreased risk of hernia and adhesions, and better cosmetic result. These writers say that all incisions, such as Sloan's, that avoid cutting the rectus, leave dead space for lymph to collect in. They therefore prefer to cut the



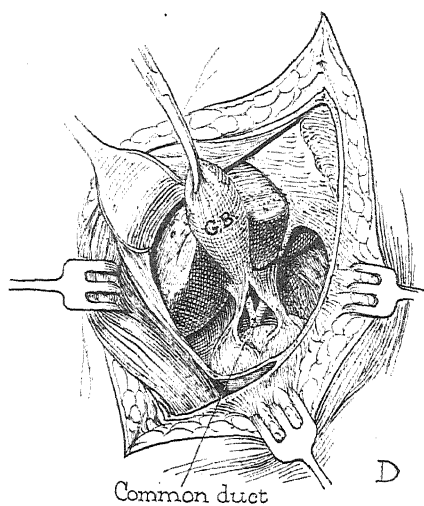
A



B



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D

Fig. 1.—Bevan's mode of approach for gall-bladder and other operations.

(By kind permission of 'Annals of Surgery')

rectus across; but to avoid a direct gap, which invites hernia, they cut the anterior and posterior sheath as high as possible and the rectus muscle as low as it can be exposed. After suturing, the incision is therefore 'staggered'.

C. Haines,³ of New York State, tilts the operating table downwards and to the left to make the cæcum and appendix present in a para-rectus (Battle) incision for appendicectomy.

A. Starr and L. H. Nason⁴ (Boston), discuss cases in which the abdominal wound burst open. This occurred 15 times out of 2455 laparotomies (0.6 per cent). There were more in the lower abdomen than the upper, and cases of carcinoma predominated. Probably the usual initial cause is a knuckle of omentum getting out through an insecure peritoneal closure. Sepsis is sometimes an important factor.

P. Moure and R. Martin⁵ have had twelve cases in which the round ligament of the liver formed part of an epigastric fatty hernia, and gave rise to local pain or dyspeptic symptoms cured by resection and suture of the linea alba in front of the gap.

Local Anæsthesia in Abdominal Surgery.—N. Ishikawa⁶ comes to the following conclusions on the use of percaine for intra-abdominal operations: "Splanchnic anæsthesia is not sufficient for complete insensibility of the stomach. By block anæsthesia of the pneumogastric nerves, especially the left nerve and the splanchnic, complete anæsthesia of the stomach may be obtained. Painless operation on the stomach or biliary tract is possible under vagosympathetic (vagosplanchnic) diffusion anæsthesia. An injection of **Pantopon** or **Pavinal** and **Atropine** is recommended. For interventions on the small intestine anæsthesia of the plexus at the root of the mesenteric vessels is satisfactory. In appendicitis, a painless operation may be performed only under anæsthesia of the perivascular plexus along the appendicular artery. In the presence of abscess or multiple adhesions, diffusion anæsthesia becomes necessary. Ileocæcal resections or resections of the large intestine should be done under anæsthesia of the plexus along the corresponding mesenteric vessels. For the descending colon and the sigmoid, diffusion anæsthesia of the pelvic cavity induced with **Percaine** or regional anæsthesia of the sacral sympathetic, besides anæsthesia of the perivascular plexus, may be used. For resection of the hepatic loop diffusion anæsthesia is recommended. For other interventions on the abdominal viscera, anæsthesia of the perivascular plexus is recommended. For the liberation and resection of adhesions and in cases of acute inflammation of the abdominal viscera, high-frequency currents may be used successfully with local anæsthesia. Percaine is especially suited for diffusion anæsthesia of the abdominal viscera. For vagosympathetic anæsthesia the author injects from 50 to 100 c.c. of a 0.05 per cent solution of percaine into the upper abdominal cavity before opening the peritoneum. From two to five minutes later he opens the peritoneal cavity and injects from 50 to 100 c.c. into the subdiaphragmatic space, and after another period of from two to five minutes he induces anæsthesia of the anterior perivascular gastric plexus from the periphery towards the centre. This method may be designated as vagosympathetic diffusion anæsthesia combined with anæsthesia of the perivascular plexus.

"The action of percaine is more prolonged than that of novocain. Adrenalin or ephedrine are added to the percaine solution, and the anæsthesia is preceded by an injection of pantopon with scopolamine or atropine. Percaine anæsthesia combined with an injection of atropine is indicated especially for interventions on the stomach and biliary tract."

H. Finsterer,⁷ of Vienna, in three long papers gives an account of his reasons for preferring local anæsthesia in abdominal surgery. He has used it 5172

times in twenty-five years' experience, for 2445 resections of the stomach, small intestine, colon, or rectum. In 72.7 per cent of these cases no general anæsthetic at all was used. He relies on 0.5 per cent novocain both for the abdominal wall and for injection into the mesentery. He does not like splanchnic anæsthesia. In many cases it is better to use a general anæsthetic along with the local just at the commencement, and then to stop it. He allows a general anæsthetic for acute appendicitis because the operation is brief, but uses a local for chronic appendicitis even in children. In private practice the surgeon can insist on a local anæsthetic, because if the patient does not like it, he can go to someone else. His reasons for preferring local to general anæsthesia are as follows: One avoids deaths on the table, or within the first three to five days, resulting from secondary cardiac or respiratory failure due to the ether, or from damage to liver tissue, or from circulatory weakness giving rise to embolism. So-called death from shock is often, in reality, anæsthetic poisoning. Post-operative gastric and intestinal atony, vicious-circle vomiting, and occlusion of the duodenum by the superior mesenteric artery do not occur after local anæsthesia. Ether narcosis reduces the bodily resistance to mild infections, such as may lead to peritonitis. After local anæsthesia, post-operative pneumonia, though it may occur, runs a milder course and is never fatal; it is probably due to bronchial excretions on account of poor expectoration. Pulmonary tuberculosis may be lit up into activity by general anæsthesia, not by local. Finisterer maintains that surgical work, such as suturing, is better done under a local anæsthetic because there is more time. [We doubt if many will agree with him here. His criticisms of general anæsthesia may be true when it is given with little skill, but are not fair when it is at its best. —A.R.S.]

(See also ANÆSTHESIA.)

Post-operative Complications and Treatment.—In a paper on the control of distension, nausea, and vomiting, J. R. Paine, H. A. Carlson, and O. H. Wangenstein,⁸ of Minneapolis, who have been studying (rather small) series of cases of cholecystectomy, appendicectomy, and herniotomy, treated by differing routine methods, came to the conclusion that **Morphine** is often really necessary, and neither prevents, produces, nor relieves abdominal distension. They do not believe it does any harm in reasonable doses ($\frac{1}{4}$ to $\frac{1}{2}$ gr., twice a day for two days or less). Pantopon and dilaudid are no better. Saline cathartics given immediately after operation open the bowels, but are not recommended because of their other disturbing effects. **Nasal Catheter Suction-siphonage** promotes comfort and effectually prevents distension, nausea, and vomiting, and makes enemata unnecessary. It is recommended as a routine after operations on the stomach or gall-bladder, or intestinal anastomoses.

D. Balfour and H. K. Gray,⁹ of the Mayo Clinic, discuss the various theories that have been advanced to explain the occurrence of pneumonia and bronchitis after upper-abdomen operations. Pulmonary embolism, inhalation of septic mucus or vomit, and ether-irritation may contribute to, but scarcely account for, the greater frequency of lung complications after operations on the upper abdomen, as compared with the lower. Higgins, Graham, and others have shown that solid particles (e.g., graphite) are absorbed from the dog's peritoneal cavity by several different routes besides by way of the thoracic duct. Much of it passes through the diaphragmatic lymphatics and finds its way to the lymph-nodes at the root of the bronchi; the lymphatic drainage by this route is much freer on the right side than on the left. It is easy to imagine that impeded diaphragmatic contractions after operation might lead to stasis of infected particles in the bronchial lymphatic vessels and nodes, with secondary

involvement of the lungs. It is certainly true that the right lung suffers more than the left; embolism and inhalation, or ether irritation, would not explain this. To prevent post-operative troubles it is important not to open the abdomen until at least a week after a respiratory infection has subsided. In pyloric obstruction cases daily **Lavage** before operation and at the operation helps. **Atropine** diminishes secretions. The operating-room and corridors should be warm, and the patient well covered. The authors do not find spinal anaesthesia very useful in upper-abdomen surgery, and prefer gas-oxygen-ether, especially intratracheal ether, and as little as possible. Hyperventilation with 95 per cent **Oxygen** and 5 per cent **Carbon Dioxide** is used at the end. Aspiration by an œsophageal tube may be used to keep the stomach empty. Adhesive straps to fix the dressing should be used instead of bandages or binders, and they should be short. The Fowler position after return to bed helps the descent of the diaphragm, and a mixture of 10 per cent carbon dioxide and 90 per cent oxygen inhaled for two minutes every hour for the first eight hours has been found useful, by stimulating deep respiratory movements.

W. Capelle and E. Fulde,¹⁰ of Berlin, maintain that complete freedom from after-pain can be secured by injecting the abdominal wall with a long-lasting local anaesthetic. They use 30 c.c. of **Pantocain** solution in saline, 0.05 per cent, with 10 drops of **Suprarenin** to 100 c.c. It does not interfere with healing. I. S. Ravdin and C. G. Johnston,¹¹ of Philadelphia, write of the value of the slow **Continuous Intravenous Saline** injection with 5 per cent **Glucose** in all critical abdominal cases. They usually give 3000 c.c. in twenty-four hours. A needle, not a cannula, is put into the vein. It is not worth while to raise the fluid above room temperature, as it goes in so slowly. The arm or leg is immobilized by bandaging it to a pillow.

(See also PRE-OPERATIVE AND POST-OPERATIVE TREATMENT.)

REFERENCES.—¹*Ann. of Surg.* 1932, Oct., 555; ²*Surg. Gynecol. and Obst.* 1933, July, 95; ³*Med. Jour. and Record*, 1932, Sept., 206; ⁴*Jour. Amer. Med. Assoc.* 1933, Feb., 310; ⁵*Bull. et. Mém. Soc. nat. de Chir.* 1933, July, 1011; ⁶*Jour. de Chir.*, 1932, xxxix, 809; ⁷*Wien. klin. Woch.* 1932, July, 833, 868, 903; ⁸*Jour. Amer. Med. Assoc.* 1933, June, 1910; ⁹*Practitioner*, 1933, June, 625; ¹⁰*Deut. Zeits. f. Chir.* 1932, Nov., 637; ¹¹*Ann. of Surg.* 1933, May, 749.

ACNE ROSACEA. (See ROSACEA.)

ACTINOMYCOSIS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

A reminder of this condition in books of annual reference is necessary from time to time. In busy practice it may be forgotten. The reviewer has seen cases of ulceration of the duodenum and jejunum from this infection.¹ Actinomycosis of the buccopharyngeal region is quite common. The fungus gains access through small abrasions during mastication, especially in the presence of defective teeth. Fresh fruit and vegetables may be contaminated easily when packed in straw. The thorax may be infected by way of the œsophagus, yet the stomach and the small intestine are practically immune. The streptothrix has few opportunities of escaping from the small intestine, but an attack of appendicitis may be the commencing of cæcal actinomycosis. A patient may die of cerebrospinal actinomycosis in a few days. The disease may last ten years in a subcutaneous infection or prove fatal within a year when the liver is involved.

R. Bates² concludes that: Human actinomycosis appears to be invariably an infection with the non-acid-fast anaerobic streptothrix *A. bovis*. The superficial variety of actinomycosis occurs more commonly than is usually supposed. In cervico-facial cases, before the formation of pus, trismus is the

most important sign. Early diagnosis by a bacteriological examination of pus in all cases of alveolar abscess and early treatment with iodides will prevent the terrible scarring and repeated relapses associated with the disease. If a test-tube containing actinomycotic pus is tilted the granules are visible to the naked eye as greenish-grey specks adhering to the glass. When a routine bacteriological examination of all pus is impossible, this method of tilting the test-tube and examination through a hand lens would indicate the suspicious cases which need fuller investigation. In the deep variety there is such a high mortality that a routine bacteriological examination of pus in cases of empyema, appendix abscess, and subdiaphragmatic abscess is imperative. Where cases are allowed to suggest the disease by their very chronicity the disease has usually spread beyond human aid.

[Iodine in milk, introduced by H. Chitty some years ago, will often cure cases that used to be considered hopeless. Ten per cent **Tincture of Iodine**, without potassium iodide, is given in doses of 4 minims, rising to 30 minims, three times a day, in milk.—Ed.]

REFERENCES.—*Brit. Jour. Surg.* 1928, xv, 430; *Lancet*, 1933, i, 571.

ADDISON'S DISEASE.

W. Langdon Brown, M.D., F.R.C.P.

Treatment by Adrenal Cortical Extract.—F. A. Hartman and others,¹ continuing their observations on adrenal cortical extract, emphasize the need for adequate dosage, especially in a crisis. As with insulin, an intercurrent infection appears to call for larger doses. They also used it for other types of asthenia, but, beyond improvement in appetite and sleep, they do not think the evidence as to its value is conclusive as yet.

J. M. Rogoff,² reporting further cases treated with his cortical extract—**Interrenalin**—lays stress on the value of daily intravenous doses of from 250 to 1000 c.c. of **Normal Saline** containing about 5 per cent **Dextrose**. He believes that in addition to the loss of a hormone there is also an auto-intoxication from accompanying metabolic disturbances, which this treatment serves to alleviate.

G. Lyman Duff and C. Bernstein,³ in describing 5 cases of Addison's disease due to atrophy of the adrenal cortex, also stress the existence of a circulating toxin, which, indeed, they believe to be the causative agent in this type of case, and not merely an accompaniment.

J. G. McCrie and others,⁴ while agreeing that in Addison's disease the cortex is mainly at fault, are of opinion that the absence or diminution of adrenalin plays a part in the symptomatology. It cannot be a purposeless whim of nature to have associated cortex and medulla so closely. They think that there are probably several hormones in the adrenal cortex which are unevenly represented in potency in the extracts at present available.

Favourable results are reported by G. A. Harrop, jun. and A. Weinstein, L. G. Rowntree and C. H. Greene, using the Swingle-Pfiffner extract, and by P. C. Baird and F. Albright,⁵ who employed Hartman's preparation.

The great outstanding difficulty in treating Addison's disease by any of these extracts is their very high cost. There is, however, a hope that this may to a considerable extent be overcome. It has been found that by filtering an extract of the whole gland through a Permutit apparatus it is possible to do away with the laborious separation of the medulla and cortex by dissection, since the adrenalin from the medulla is destroyed by the alkali employed therein.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1932, Oct. 29, 1478; ²*Ibid.* Oct. 15, 1309; ³*Bull. Johns Hopkins Hosp.* 1933, Jan., 67; ⁴*Brit. Med. Jour.* 1932, ii, 622; ⁵*Arch. of Internal Med.* 1932, Sept., 394.

ADRENALECTOMY.

A. Rendle Short, M.D., F.R.C.S.

According to R. Leriche and R. Stricker,¹ of Strasbourg, this operation, ever since it was introduced by Oppel in the treatment of thrombo-angiitis, has had 'a bad press'; it has been condemned by those who have never tried it. The fact is that in suitable cases the results are excellent and durable. During seven years the writers have employed it twelve times for Buerger's thrombo-angiitis. It cannot, of course, do the impossible; if the main arteries are already completely blocked and the collateral circulation at maximal dilatation, neither sympathectomy nor adrenalectomy can help. It is often difficult to know how far this blocking has taken place; there is a method of arteriography introduced by Raynaldo dos Santos that may prove very valuable in this connection. But if the main arteries are not completely blocked, or if the collateral circulation is capable of vaso-dilatation, wonderful results can be obtained. [We can testify to this of our own observation in one of Leriche's cases.—A. R. S.] The evolution of the disease is arrested, the pain ceases, trophic lesions heal, and the threat of gangrene recedes, but intermittent claudication will persist, and the circulation remain precarious. If a hand or foot is cold, insensitive, immovable, and of a violet colour, it is too late to save it. Oppel had to amputate 50 of his 115 cases of adrenalectomy. Its main virtue is to prevent the loss of limb after limb, which is the rule in Buerger's disease. When pulsation can still be felt or can be restored by a warm bath, when there are ulcers but not gangrene, operation is indicated. Shall it be sympathectomy or adrenalectomy? Leriche prefers the latter when the tendency to angitis extends to more than one limb. It has been objected that the operation is dangerous, but of 19 cases he has only lost one. In cases of Buerger's disease, there were no deaths. Sometimes a good result has been obtained by removing a suprarenal first, and doing a sympathectomy on a subsequent occasion. Of 12 cases of adrenalectomy for thrombo-angiitis, 3 gave a perfect result (followed up five and seven years), 2 others did well, 5 failed, and 2 relapsed. The operation may be difficult. The approach is by a left subcostal incision, with or without resection of the twelfth rib.

REFERENCE.—¹ *Presse méd.* 1932, Aug., 1237.

AGRANULOCYTIC ANGINA (Malignant Neutropenia, The Neutropenic State, etc.)

Stanley Davidson, M.D., F.R.C.P.E.

Numerous papers have appeared during the past year regarding the etiology and treatment of a syndrome whose principal features are intense necrosis of tissues and marked toxæmia, while blood examination reveals a great diminution in the white cells, particularly the polymorphonuclear leucocytes (T. Fitz-Hugh and B. I. Comroe,¹ H. Harkis,² and E. Bulmer³). There is good evidence to show that there are two types of this syndrome, one in which the essential leucopenia is the result of no known toxic agent, and hence may be described as 'primary' neutropenia, and the second in which the low white-cell count is a direct result of some recognized toxic process which depresses bone-marrow function. In the primary condition studies of the bone-marrow show intense hyperplasia of the primitive white cells, and the view is expressed by C. A. Doan⁴ and others that the essential feature is a maturation arrest in the development of the granular series of white cells, in the same way that pernicious anæmia is believed to be the result of a similar process in the development of the erythrocyte. Working on the basis that the normal stimulus for maintaining the leucocyte level in the blood-stream is produced by the action of the liberated products from disintegrated cells of the same type, on their immature precursors in the bone-marrow, Henry Jackson, jun., prepared adenine and guanine nucleotides which are now marketed under the trade

name of '**Pentose Nucleotide K.G. 96**'.* H. Jackson, F. Parker, and F. H. L. Taylor⁵ treated 69 cases of malignant neutropenia with this preparation; 26 per cent died, compared to a figure which varies from 50 to 90 per cent in the reports of other investigators, using blood transfusion, X rays, etc. The preparation was effective, the authors believe, because: (1) A favourable clinical and hematological response took place rather sharply about the fifth day of treatment, irrespective of how long the patient had been ill prior to treatment; (2) The subsequent hematological improvement in practically all cases followed the same orderly trend; and (3) The mortality was the lowest of any published series of like size. Ten c.c. of pentose nucleotide K.G. 96 should be given intramuscularly night and morning, until the white cells have definitely risen, and thereafter once daily until the white count has been normal for at least three days. In desperately ill cases the authors recommend that 10 c.c. of K.G. 96 should be diluted with 100 c.c. of warm saline and injected slowly into the vein each morning for four days, while 10 c.c. should be given intramuscularly every evening.

In the reviewer's opinion, pentose nucleotide therapy appears to offer the most promising hope for the treatment of an extremely fatal condition.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1933, April, 552; ²*Jour. Amer. Med. Assoc.* 1932, Oct. 1, 1132; ³*Lancet*, 1933, i, 1119; ⁴*Jour. Amer. Med. Assoc.* 1932, July 16, 194; ⁵*Amer. Jour. Med. Sci.* 1932, Sept., 297.

F. W. Wathlyn-Thomas, F.R.C.S.

A. E. Taussig and P. C. Schnoebelen¹ believe that agranulocytosis is increasing in frequency and that its etiology is still unknown. From a study of seven patients seen in the last year they agree with the view, now widely held, that the necrotic processes in mouth and pharynx are the result, not the cause, of the disease. Two of their patients recovered. **Roentgen Therapy** (minimum doses to the long bones) proved the most useful treatment. Three cases showed rapid regeneration of granulocytes after X-ray stimulation. In two cases it was proved that the fall in the granulocytes preceded a recurrence of the sore throat.

H. Videbech² in describing a case of *agranulocytosis of possible medicinal origin accompanied by skin eruption* raises the question of the possibility of certain chemicals, especially drugs containing the benzene ring, being an important factor in the occurrence of agranulocytosis. Although the majority of writers believe that agranulocytosis in its typical form depends on severe septic infection, there are some who hold that it is a bone-marrow reaction in individuals particularly sensitive to some specific influence. The patient Videbech describes had fever, joint pains, and oedema of fauces and uvula, with membranous ulceration and a pruriginous rash with icterus. Blood examination showed typical agranulocytosis. The patient recovered after X-ray irradiation of the long bones. His history was that for years he had been taking aspirin, and for two months he had been taking a mixture of drugs with bases of ethyl-allyl-barbiturate and dimethyl-amido-antipyrine. As well as this he used benzene in his daily work as a watch-repairer. [In view of the wide and increasing use by the laity of synthetic compounds of the barbiturates and benzene ring bodies without any medical supervision, this observation is of the utmost importance. It may possibly have a relation to the increase in the number of these cases to which Taussig and Schnoebelen refer.—F. W. W.-T.].

REFERENCES.—¹*Jour. of Laryngol.* 1933, xlviii, 72; ²*Acta Otolaryngol.* 1933, xix, 92.

* Obtainable under the name of 'Pentnucleotide,' from Menley and James, Ltd., 64, Hatton Garden, London, E.C.1.

ALCOHOL AND DRUG ADDICTION. (*See also* DRUNKENNESS, TESTS FOR.) *H. Devine, M.D., F.R.C.P.*

Alcoholism.—D. K. Henderson¹ observes that every one dealing with the habitual drunkard recognizes that the process of arrest, trial, and imprisonment is a perfectly useless procedure, entailing considerable expense, and with no remedial element in it. It has been estimated that the cost of the prison institutional system per imprisonment, regardless of the period, is just under £60. Modern civilization demands a wider, more humanitarian outlook, one which is determined by the psycho-biological concept that all disorder of conduct is a reaction to circumstances either of a personal or environmental nature. The emphasis is on the man himself as a total personality rather than on the symptoms—as evidenced by the conduct disorders which he has shown. The chronic alcoholic is a sick man who needs care, help, and treatment under the best type of medical régime.

Unfortunately if every alcoholic subject was regarded as a patient and treated from the medical point of view, the incidence of recovery would probably be very small, since the treatment of such patients is on the whole discouraging as far as permanent cures are concerned. For any sort of cure to be effected, prolonged treatment is necessary, and few patients will submit to this. Four cases cited by Henderson, with one exception, illustrate this difficulty. All of them were of excellent position and good mental and physical equipment. With the exception of one case, all of them felt sufficiently readjusted in a few weeks to start afresh, but failed lamentably. The first three were more naturally prone to alcoholism, whereas in the fourth case there was a more obvious personality disorder, a greater degree of psychological insight, a clearer appreciation that alcohol was an expedient, an attempt "to get away from the prison house of reality back to the Golden Age." In the latter type the outlook is more hopeful, as there is something more obvious to go for. Thus it has to be admitted that the results of treatment in these cases are far from satisfactory.

It is not surprising that the family and practitioner are disappointed with the specialist for not having some specific course to suggest. The difficulty is that such patients are rarely certifiable in the strict sense of the term; and, furthermore, if it is decided to certify, it is essential to ascertain that the patient has not been under the influence of drink for some time. In other words, it is not permissible to certify a person when that person is under the influence of liquor. Sometimes such patients are willing to enter a mental hospital on a voluntary basis, but they are seldom willing to stay after a few weeks. Any treatment to be helpful must be continued for from three to six months. It has to be admitted, unfortunately, that we know of no specific specialized form of treatment for chronic alcoholism which can whole-heartedly be recommended. The control of the patient under specially supervised conditions, a careful psychiatric examination in the early stages, an understanding of the possible psychological determinants, may all help in individual instances, but there is no sense of security about any of them. The ideal treatment has to be based on the prophylactic educational level, and in this matter the medical profession should give a far stronger lead. Efforts should be primarily directed to influencing the older groups of school children before the taste for alcohol is acquired.

In a lengthy paper on the causation, treatment, and control of the alcoholic habit, A. Baldie² expresses much the same views as Henderson in regard to the inadequacy of our therapeutic methods. He points out that a survey of literature on alcoholism shows that scientific research and discovery in the field of etiology and psychopathology has outstripped advances in treatment;

and that it is principally in institutions and by specialists that a system of practical treatment is being evolved. The class of habitué to which medical advice can be of help is greatly reduced by the unwillingness of many to undergo treatment, or to contemplate abstinence. It is, of course, essential that he must be anxious to be cured, and willing to abstain completely. It is not, perhaps, a patient's volition that is the deciding factor so much as his deliberate and conscious choice. The writer states that the persons unsuitable for home treatment are : mental defectives, psychotics, constitutional inferiors, and others requiring constant supervision ; persons who require and are otherwise suitable for treatment, but who strenuously resist treatment, or who, not refusing openly, fail to co-operate in treatment ; pseudo-alcoholics—these are persons who, whether they indulge in alcohol or not, are wrongly brought for treatment, it may be from ulterior motives, by relatives.

The treatment of the earlier habitué is that of his inadequacy and mal-adjustment to life, and of the associated physiological and somatic changes. A preliminary medical history should include a record of : physical disease, of inherited or acquired organic inferiorities, and of the physical and functional activities of the patient from infancy ; psychological experience ; domestic, social, sexual, and religious life ; and alcoholic habit. The preliminary history will also contain a record of achievements and frustrations at school, during apprenticeship, and in subsequent occupations ; love affairs ; social and family relationships ; and so on. Baldie states that the Adler method of psychotherapy has the merit of simplicity and of easy reference to such a history.

Alcohol and the Germ-cell.—In a contribution on alcohol and drug addiction in Germany, P. Wolfe³ makes some interesting comments on the possible blastophoric effects of alcohol. The writer points out that the problem of the individual is closely connected with the question—so important from the point of view of eugenics and theories of heredity—whether alcohol exerts a toxic effect on the germ-cells and thus favours the production of degenerate progeny. Although experiments on heredity in the progeny of male mice in which an alcoholic condition has been produced seem to show an increased death-rate amongst the sucklings, Wolfe finds himself in entire agreement with E. Brantz, who points out that it is not justifiable to assume from these experiments that the effect in man is analogous. The experimenter produces maximal, or at any rate unusually marked, damage, and induces mutations of a less complex nature than, for instance, mental deficiency, psychopathy, and epilepsy. Direct experiment on human alcoholics is therefore necessary, although as a result of unsatisfactory methods the majority of such experiments are of but little value. The children of non-psychopathic alcoholics suffering from delirium showed no increased incidence of disposition of anomalies. Panse investigated the children of habitual drinkers and found that there was no difference between the children born before the onset of alcoholism and those born after it. In man we must be content at first with smaller numbers than the biological experimenter and with one generation only, so that for the moment the question whether alcohol damages the germ cells must be left open, instead of being answered in the affirmative, as was frequently done previously. On the other hand, bodily and mental deficiency is often found in the children of drunkards ; it is not, however, due to the toxic damage to the germ-cells but is the effect of bodily ill-treatment, sexual damage, criminal acts, and premature indulgence of alcohol in the parents' company. These facts and findings rob the anti-alcoholic propagandist of advertising material but need not lead the eugenicist to despair.

Drug Addiction.—

Unusual Forms of Drug Addiction.—E. W. Adams⁴ observes that there are

always a certain number of persons who are too poor to pay for life. For these three courses are open: (1) They may borrow—that is, they may draw upon the sources of individuals more vitally endowed than themselves; (2) They may acknowledge themselves paupers and accept the free lodgement of death; or (3) They may use a kind of default and seek means to make reality less real. It is to this last class that our alcoholics and drug addicts belong. The drug addict is not valiant; he can neither accept this robust universe nor escape it by an ascent to rarer regions. The writer gives an interesting account of some unusual forms of 'escape from reality' by means of drugs. A few instances may be cited.

Under the name of 'Paregorism' French authors have described a form of *opium* addiction which presents some unusual features. The opium is obtained by the use of *tr. camph. co.*, and owing to the weakness of this preparation in opium, the addicts have to take enormous quantities to satisfy their craving. As a consequence, the symptomatology is a compound of that of opium euphoria with alcoholic confusion and hallucinations. Not only so, but "impulsive violent reactions" are also noted, and it is thought that the large amount of essence of anise ingested has an important contributory effect in the production of the peculiar syndrome. Indulgence in paregoric is thought to have its origin in the difficulties experienced by drug habitués in obtaining their ordinary forms of dope, owing to restrictive legislation.

A new and very curious method of indulgence in *heroin* has sprung up in the Far East in recent years. The heroin is made up into pills and smoked in the same way as opium. More curious still, these pills also contain *strychnine*, *quinine*, and *caffeine*. They are known as "anti-opium pills", and each hold $\frac{1}{10}$ gr. of *heroin* and about $\frac{1}{40}$ gr. of *strychnine*. Vast quantities are made and consumed, and it is said that the practice is far more deadly than opium in its effects on the system of the smoker.

In India the chewing of *cocaine* has now obtained footing. The drug is wrapped in betel leaf, chewed, and slowly absorbed by the buccal mucous membrane from the charged saliva which is held in the mouth. It is estimated that there may be as many as half a million of these cocaine chewers in India. The motives leading up to the habit are stated to be usually vicious and the results deplorable.

Another curious case is that of a chemist who became addicted to *nitrous oxide*. This man gradually acquired the habit of inhaling a small quantity of gas every day. In order to better indulge his abnormal passion he fitted up an ingenious apparatus by means of which he was able to take a whiff whenever he felt "so disposed". He ended up in what our Chinese friends would call "an establishment for irregular intellects".

Adams observes that it is an interesting problem whether the nitrous oxide debauches rendered him insane or whether they were merely a symptom of a deranged mentality. It is difficult in the narcomanias to distinguish between the cart and the horse, though we should probably not go far wrong in holding that in the average case the underlying psychopathic basis is always the horse, though the cart which it pulls may be of varying structure and make. This is well borne out by an exceedingly instructive history related by Hahn. He cites the case of a young woman who took 2 grm. of cocaine subcutaneously and 0.08 grm. morphine. After an easy withdrawal treatment, without complications, she procured large quantities of alcohol. When she kept free from alcohol she suddenly began to smoke up to eighty cigarettes daily. Directly these were forbidden she became an 'extravagance maniac'. She incurred, at the time of greatest financial stringency, a petty expenditure of 150 marks daily and for the most part on completely unnecessary things.

When finally this senseless extravagance lost its savour, she took to dancing in a manner which one could only call 'dance mania', and also, in connection with her mania, she gave herself up to cathartics.

TREATMENT OF DRUG ADDICTION.—E. W. Adams⁵ gives a comprehensive review of the numerous therapeutic methods employed in the case of drug addicts. At the outset Adams points out that the individual practitioner can do much by way of prevention. He can see to it that no addict is created by any fault of his own. He can remember that there are pain-relieving drugs other than morphine, and he can see to it that the patient is never supplied with a syringe. The family physician can also act with special caution when ordering narcotic drugs to unstable persons. He is in a favourable position to recognize early the beginning of functional nervous and physical disorders which are often of tardy development and which may be amenable to treatment in their early stages. He may thus be able to prevent the development of a condition which creates a predisposition in the patient to resort to narcotics, and so play an important part in prophylaxis. In short, he both has and can create many opportunities for contributing towards prevention of addiction.

The treatment of addiction comprises two stages: (1) Disintoxication; (2) Rehabilitation.

1. *Disintoxication.*—This is a treatment designed to free the addict from his poison, or, in other words, it aims to withdraw the drug, either suddenly or gradually, and to follow this treatment by measures directed to the restoration of the general health. The following table is an attempt to classify these methods of disintoxication:—

a. *The ambulatory method:*—This method may be defined as one in which the patient is free to go about and receives from the practitioner, and under his instructions, such quantities of his narcotic drug for self-administration as are deemed necessary.

b. *Methods devised to secure withdrawal within a limited period:*—

i. The abrupt (sudden) withdrawal method: (a) abrupt withdrawal without special measures ('cold turkey'); (β) abrupt withdrawal under hypnosis; (γ) abrupt withdrawal assisted by drugs of the atropine series; (δ) abrupt withdrawal assisted by 'specific' treatment (e.g., 'narcosan', vegetable proteins, antibodies); (ε) abrupt withdrawal with special symptomatic treatment (e.g., by means of euphyllin or insulin).

ii. Rapid withdrawal methods: (a) rapid withdrawal with injections of autogenous serum; (β) rapid withdrawal aided by drugs of the opium series; (γ) rapid withdrawal under treatment by endocrine preparations; (δ) rapid withdrawal under light anaesthesia; (ε) rapid withdrawal under drugs of the atropine series.

iii. The gradual reduction method.

c. *Treatment by the 'conditioned reflex' method.*

2. *Rehabilitation.*—Under this heading are included improvement of physical health, occupation, healthy sports, change in environment, and psychotherapy.

Insulin in the Treatment of Chronic Morphinism.—F. S. Modern⁶ records his experience with insulin as a therapeutic agent in a case of morphia addiction. Morphine was at once withdrawn after admission to hospital, and 'shots' of insulin substituted, 10 units thirty minutes before each meal. The patient was placed on a high carbohydrate diet, and 200 c.c. of orange-juice were given two hours after each meal to obviate late reactions. He received 10 gr. of sodium bromide every two hours throughout the day, and 3 gr. of luminal before retiring, to be repeated in two hours in case of sleeplessness. The insulin dosage was raised to 15 units on the second day before breakfast and lunch,

and to 20 units before dinner, this latter dosage being adhered to for the remainder of the patient's stay in the hospital and for two weeks after discharge. The time interval between insulin and meal was increased simultaneously from half an hour to an hour, which caused a moderate hypoglycæmia just before meal time. The patient was discharged on the sixth day in excellent mental and much improved physical condition. There has been no relapse in the ensuing seven months either in morphinism or alcoholism despite heavy financial and mental strain during that period.

This is the eighteenth case of morphia addiction treated by insulin that has been reported in the literature. Obviously no conclusions should be drawn from such a small number of cases, either as to the immediate or remote efficacy of the treatment. It would be desirable, however, to apply this method in large series of well-controlled cases, with appropriate follow-up studies as to its possible merits, in view of encouraging observations in the reported cases.

REFERENCES.—¹*Edin. Med. Jour.* 1933, Jan., 1; ²*Brit. Jour. Inebriety*, 1932, Oct., 45; ³*Ibid.* 1933, April, 141; ⁴*Ibid.* July, 1; ⁵*Practitioner*, 1932, Aug., 234, Sept., 390; ⁶*Med. Jour. and Record*, 1932, Aug., 163.

AMOEBIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—A protozoal survey of 1000 prisoners in San Francisco by H. G. Johnstone, N. A. David, and A. C. Reed¹ showed 92 (or 9·2 per cent) to be carriers of *E. histolytica*, 78 of whom had been in endemic areas and 36 had lived in tropical regions: 52 had suffered from gastro-intestinal symptoms, and 16 from diarrhoea or dysentery, and those without symptoms were mostly young men who had only recently visited endemic areas.

The viability of *E. histolytica* cysts has been studied by T. and V. Wight² by keeping them in an ice-box and subculturing at intervals, which proved successful up to forty-six days, thus agreeing closely with Dobell's figure. By repeated subcultures Dobell's strains could be kept going for several years, and under most variable conditions of temperature, climate, and environment they survived up to twenty-seven days. The conclusion of Yorke and Adam that these cysts could only survive ten days is thus disproved.

An accurate method for counting *E. histolytica* *in vitro* with the aid of a haemocytometer is described by M. Paulson.³ J. Andrews⁴ reports finding *E. histolytica* in a Baltimore dog with a chronic bowel infection, so he suggests this animal as a possible carrier of infection to man.

TREATMENT.—The incidence and treatment of amœbiasis in Panama is dealt with by H. H. Anderson.⁵ He mentions that since the discovery of emetine dysentery as the first cause of death in Costa Rica has been displaced by tuberculosis, but a high rate of infection will continue until more regular efforts are made after the control of the symptoms to eradicate the pathogenic amœba, which can be done as shown by the fact that in the sanitated areas of Panama the disease has been reduced to the rate in temperate climates by more effective treatment and good water-supplies. An intensive study has been made in the past three years of forty-four drugs to find one with high amœbicidal powers and low toxicity, and Carbasone, or 4-carbamino-phenyl-arsonic acid, containing 28·8 per cent of arsenic, is considered to be the best. Thus 75 mgrm. per kilo rids 90 per cent of the patients of their pathogenic amœba, and it is non-toxic in four times that amount. He advises for this purpose in adults 0·25 grm. of carbasone twice daily in capsules for ten days; his cases were controlled by stool examinations up to three months after treatment. In obstinate cases he advises retention enemata of 2 grm. of the drug in 200 c.c. of warm 1 per cent sodium bicarbonate instilled into the

rectum overnight after a cleansing enema, and repeated every other night for five treatments. No toxic symptoms beyond slight epigastric discomfort were noted after the drug. The use of carbarsone is also reported on by R. N. Chopra and B. and S. Sen⁶ in Calcutta, who also used it in 0.25-grm. ($3\frac{3}{4}$ -gr.) doses twice daily for ten days, with 23 cures and 4 undetermined in 31 cases with no untoward effects.

The use of **Kurchi** in chronic amœbiasis is further reported on by H. W. Acton and R. N. Chopra,⁷ who found that intramuscular injections of 2 gr. of the alkaloid daily are as effective as emetine, but they are very painful, and the bismuth iodide compound of the total alkaloids compares favourably with that of emetine in 10-gr. doses twice daily half an hour after 1 drachm of sodium bicarbonate and 40 gr. of sodium citrate for ten days or longer; but a second course is not desirable. In cases complicated by bacillary dysentery infection the treatment should be preceded by autogenous vaccines. A. B. Ghosh⁸ also deals with the use of an extract of kurchi, and advises one made with 60 per cent alcohol, as this includes tannins, mucilage, and resinous matters, which he thinks may be beneficial; but this remains to be tested by clinical trials.

An interesting study of halogenated oxyquinolines, of which one under the trade name of **Yatren** has been exploited for dysentery with little critical study, is recorded by N. A. David, H. G. Johnstone, A. C. Reed, and C. D. Leake, of San Francisco.⁹ They now report on the use of iodochlorhydroxy-quinoline (**Vioform** N.N.R.) orally in amœba-infected animals and in man, as their experience of yatren has been disappointing. The new preparation is a greyish-yellow powder, almost insoluble in water and sparingly in alcohol; it contains 40 per cent of iodine, and is absorbed to some extent from the bowel as it is partly excreted in the urine. They recommend 0.75 grm. daily in three capsules of 0.25 grm. each for ten days, the course being repeated after a week's rest to total 15 grm. Clinical cure was obtained in 38 out of 47 cases, as shown by three to six months' follow-up; there were 6 recurrences among 7 patients exposed to re-infection, and no evidence of toxicity was noted in any.

In a survey of 1000 cases of dysentery seen during the war in Egypt, S. Rosebery¹⁰ advocates lavage of the large bowel by **Chlorine Water**, strength not stated.

REFERENCES.—¹*Ind. Med. Gaz.* 1932, Aug., 446; ²*Jour. Trop. Med. and Hyg.* 1932, Nov. 15, 337; ³*Ibid.* 1933, April 15, 109; ⁴*Ibid.* March 15, 65; ⁵*Ibid.* 69; ⁶*Ind. Med. Gaz.* 1933, May, 315; ⁷*Ibid.* 1932, Jan., 6; ⁸*Ibid.* 13; ⁹*Jour. Amer. Med. Assoc.* 1933, May 27, 1658; ¹⁰*Med. Jour. of Australia.* 1933, April 1, 391.

ANÆMIA: A CLASSIFICATION. Stanley Davidson, M.D., F.R.C.P.E.

In last year's MEDICAL ANNUAL (p. 25) reference was made to a paper by the reviewer on "The Classification and Treatment of Anæmia, with Special Reference to the Nutritional Factor."¹ Special emphasis was laid on the modern view that many forms of anæmia are essentially deficiency diseases. A recent contribution by R. Ottenberg² on the reclassification of the anæmias extends and enlarges these aspects. This classification is based essentially on pathogenesis and correlated with the effects of treatment. Anæmia is divided into three main groups: (I) Due to deficiencies; (II) Due to interference with blood formation; (III) Due to hæmolytic processes.

The remarkable advance in knowledge regarding the etiology of the anæmias which has been made during the past ten years renders the terms 'primary' and 'secondary' obsolete and undesirable. High colour index anæmia (hyperchromic macrocytic anæmia) and low colour index anæmia (hypochromic microcytic anæmia) are included in Group I, since both are the result of a

deficiency of one or other of the factors essential for blood formation. A reversion to megaloblastic blood formation occurs and a hyperchromic macrocytic anæmia results when an insufficient supply of the specific anti-anæmic factor found in liver is available to the bone-marrow. This insufficiency may arise from different causes—i.e., inadequate food intake, defective gastric secretion, or imperfect absorption from the alimentary tract. It is not surprising that a similar blood picture may occur in widely different diseases, e.g., tropical macrocytic anæmia (Wills), Addisonian pernicious anæmia, sprue, and celiac disease. Similarly, hypochromic microcytic anæmia occurs when an iron-deficient diet is eaten over prolonged intervals; when iron absorption is defective, consequent on achlorhydria, etc.; or when increased demands are present, as in pregnancy, menorrhagia, etc. Group II includes the aplastic anæmias, complete or partial, idiopathic or secondary to recognized toxic causes. Group III includes the two forms of acholuric jaundice, familial and acquired, as well as the anæmias secondary to intravascular hæmolytic, such as occurs in malaria, streptococcal septicæmia, or in the presence of hæmolytic poisons, e.g., snake venom, phenylhydrazine.

REFERENCES.—¹*Edin. Med. Jour.* 1932, xxxix, Nos. 7, 8; ²*Jour. Amer. Med. Assoc.* 1933, April 29, 1303.

ANÆMIA, ACUTE HÆMOLYTIC, OF LEDERER. (See also ANÆMIA IN CHILDHOOD.) Stanley Davidson, M.D., F.R.C.P.E.

R. J. L. O'Donoghue and L. J. Witts¹ report a case of acute hæmolytic anæmia, and have selected from the literature 32 other cases upon which a general picture of the above-named disease has been based. The criteria on which the group has been selected are: (1) The anæmia is associated with pyrexia and signs indicative of infection, though none of the familiar micro-organisms can be inculcated; (2) The anæmia is hæmolytic in type, the white cells are usually increased, and there is no megalocytosis; (3) There is no evidence of nutritional or alimentary disease; (4) The illness is of a self-limiting character, tending to death or complete recovery within a period usually of a few months; (5) **Blood Transfusion** is of the greatest value.

REFERENCE.—¹*Guy's Hosp. Rep.* 1932, Oct., 440.

ANÆMIA IN CHILDHOOD. Reginald Miller, M.D., F.R.C.P.

In last year's MEDICAL ANNUAL (p. 35) attention was paid to some of the problems of anæmia in infancy; and during the period under review for the present volume a great many communications have appeared bearing on the subject of the diseases and disorders of the blood in infancy and childhood. So numerous have these been that it will be impossible to deal with all of them with the detail that their importance deserves, and therefore it may perhaps be permissible to depart from the usual custom of the MEDICAL ANNUAL and give a list of the titles of the papers, with the authors' names, in the bibliography at the end of the article, so as to enable readers to refer to such of them as may strike their fancy.

Hæmoglobin Level During the First Year of Life.—H. M. M. Mackay and L. Goodfellow²⁰ in 1931 produced a set of figures for the normal and average levels of hæmoglobin during the first year of life, and on them satisfactorily established the frequency of nutritional anæmia in infancy. Since then there has been an improvement in the accuracy of the instruments used in measuring the percentage of hæmoglobin, and this has led Mackay¹² to revise her figures. In her revision she has taken the opportunity of including figures for the first and eighth days of life. The alteration in some of the figures is as much as 7 per cent, but it must be allowed that strict accuracy is probably impossible.

As Mackay states, there is a difference in the hæmoglobin readings according to whether the blood is taken from the heel or the ear; and two samples taken at the same time (e.g., from two fingers) may show a difference of as much as 5 per cent, though usually not more than 1 to 3 per cent.

The revised normal and average hæmoglobin values in terms of the Price-Jones-Haldane standard are as follows :—

AGE	'NORMAL' HÆMOGLOBIN VALUES	'AVERAGE' HÆMOGLOBIN VALUES			
		Breast-fed		Bottle-fed	
		Hb	No. of cases	Hb	No. of cases
	Per cent	Per cent		Per cent	
Under 24 hours ..	143	145.7	62	—	—
8th day ..	130	131.4	55	—	—
1—1 month ..	106	105.6	84	—	—
1—2 months ..	88	83.5	120	80.0	42
2—3 ..	74	73.1	123	69.4	99
3—4 ..	77	74.4	103	71.0	111
4—5 ..	81	78.2	92	74.3	114
5—6 ..	86	78.2	86	75.8	116
6—7 ..	86	77.8	67	74.5	113
7—8 ..	86	76.4	61	73.5	115
8—9 ..	86	73.9	65	73.2	100
9—10 ..	86	74.6	60	72.2	85
10—11 ..	86	72.8	59	70.7	74
11—12 ..	86	73.1	55	70.1	66
12—13 ..	86	73.0	47	69.1	58
13—14 ..	86	76.4	37	70.4	35

In a further paper¹³ Mackay discusses the factors causing variation in the hæmoglobin levels during the first year of life.

Nomenclature.—The anæmias of infancy can in the majority of cases be classified into two main groups: (1) Those in which there is a deficiency in one or more of the elements necessary for the synthesis of hæmoglobin, or for the production of the erythrocyte, or for both of these; and (2) Those in which there is increased destruction of the erythronic elements. The first of these groups is usually spoken of as the 'deficiency anæmias', and the second as the 'hæmolytic anæmias'. Both are discussed below.

L. G. Parsons¹ is satisfied with this classification, but not with the names usually given to the groups. He points out that a deficiency anæmia may arise even when the diet supplies all the elements necessary for the production of red cells with their normal content of hæmoglobin. Defective absorption from the alimentary tract will be one such possible explanation; and H. Josephs¹⁷ has pointed out that even with adequate absorption, the body may fail for some reason to carry out the synthesis of hæmoglobin. For this group, therefore, Parsons prefers to use the term 'anhæmopoietic' instead of 'deficiency' anæmia. With still more force he criticizes the term 'hæmolytic' as applied to the second group of anæmias. This should strictly imply no more than that the anæmia is due to the destruction of the circulating red cells, whereas with this process there is usually damage to, or destruction of, the precursors of the red cells in the hæmopoietic centres; and the main cause of the anæmia may be damage to either the circulating cells or the hæmopoietic centres. As we now have A. E. Boycott's useful term 'erythron' to connote 'the tissue which is made up of the circulating red cells and the cells in the bone-marrow (and sometimes elsewhere) from which they arise', Parsons puts forward the term 'erythronoclastic' as more accurate than 'hæmolytic' for the anæmias of this type.

DEFICIENCY (ANHEMOPOIETIC) ANÆMIAS.

The deficiency anæmias of infancy and childhood are divided by L. G. Parsons¹⁵ into two groups, hypochromic and hyperchromic. Most cases fall into the first group.

Hypochromic Deficiency Anæmias.—The hæmatological picture of hypochromic deficiency anæmia is as follows. The colour index in a case of moderate severity is about 0.6. In the less severe anæmias, although there is a fall in hæmoglobin, the red cell count is little if at all diminished; in the more severe anæmias both hæmoglobin and red cells are reduced, the reduction of the hæmoglobin being proportionately greater than that of the red cells. Reticulocytes are absent, or present only in very scanty numbers, not being more than 0.4 per cent of the red cell count. A few normoblasts may be found in the blood stream in the more severe cases. The fragility of the red cells is normal. There are no constant changes in the leucocytes. The platelets are present in normal or slightly reduced numbers.

Infants suffering from deficiency hypochromic anæmia are very prone to contract infection which may to some extent alter the blood picture, a certain degree of destruction of the erythronic elements occurring and the white cells showing the reactions characteristic of infection.

The most common types of hypochromic deficiency anæmia found in infancy and childhood are: (1) Nutritional anæmia of infants; (2) Hypochromic anæmia of celiac disease; (3) Anæmia of scurvy; and (4) Anæmia of cretinism.

1. *Nutritional anæmia of infancy* is mainly due to lack of iron, though a deficiency of copper, vitamin C, and thyroxin may play a part in its production. The lack of iron may arise from deficient pre-natal storage or post-natal supply, or from a mixture of both factors. Parsons gives the following possibilities:—

a. Deficient ante-natal storage: (i) Iron deficiency in the maternal diet. (ii) Nutritional anæmia in the mother. (iii) Deficient transference of iron from mother to fœtus. (iv) Premature birth, the fœtus not having time to complete its iron stores. (v) Twin pregnancy, the iron stores obtained from the mother being inadequate for both children.

b. Deficient post-natal supply: (i) Insufficient supply of iron in breast milk, possibly due to iron deficiency in the maternal diet. (ii) Artificial feeding with cow's milk. (iii) Prolongation of milk (breast or cow's) feeding beyond the normal lactation period.

c. Deficient ante-natal storage and post-natal supply.

Owing to pre-natal factors congenital anæmia may be produced (Parsons¹⁴), and the effects of the maternal supply of iron to the fœtus are well exemplified in the cases quoted by A. V. Neale and J. C. Hawksley.⁶

This type of anæmia is usually easily cured by the administration of iron, and the usual preparation given is that of **Iron and Ammonium Citrate** in daily doses of 5 to 10 gr. This form of iron contains a certain quantity of copper, and much discussion has taken place on the actions of copper and yeast in the cure of nutritional anæmia of infants. The results obtained in the experimental nutritional anæmia in rats are not wholly in accord with those of clinical medicine: the value of copper and yeast seems much greater in experimental anæmia, but Parsons is of opinion that in exceptional cases in infancy **Copper** at least may be necessary as a supplement to iron therapy.

2. *The hypochromic anæmia of celiac disease* is the common type of anæmia found in that disorder. It is probably due, in Parson's opinion, to defective absorption, and is rapidly cured by adding **Iron** to the fat-free diet. The

anæmia is also possibly related to hypo-acidity, as achlorhydria is not uncommon in cæliac disease. Free acid can, however, always be obtained in response to histamine.

3. *Scurbutic anæmia* is due to deficient post-natal supply of vitamin C, but ante-natal storage of this is probably a factor in at least delaying the onset of scurvy. The anæmia responds well to **Anti-scurbutic Treatment**.

4. *The anæmia of cretinism* is to be regarded as due to deficiency in thyroxin, and is cured by the exhibition of **Thyroid**.

Hyperchromic Deficiency Anæmias.—These are rare in childhood, but have been described in association with long-lasting and usually imperfectly treated cases of cæliac disease (see 'Steatorrhœa, Idiopathic', MEDICAL ANNUAL, 1933, p. 444). It has also been described in children infected with *Bohreria cephalus latus*. [The present writer²¹ has also described it in a case of sprue commencing at the age of 11½ years, an exception to the rule that this disease does not occur in children.—R. M.]

HEMOLYTIC (ERYTHRONOCLASTIC) ANEMIAS.

These anæmias are of the hyperchromic type and show marked anisocytosis and poikilocytosis. If the hæmopoietic centres are not too severely damaged to respond to the call for new cells, reticulocytosis, polychromasia, megaloblastosis, and normoblastosis occur. The presence of megaloblasts and normoblasts in the peripheral circulation has not the same significance as in the deficiency anæmias, because in them the maturation of the erythrocyte cannot take place unless the missing factors are supplied, whereas in the erythronoclastic anæmias these immature cells appear in the peripheral circulation only because blood formation is extremely active.

L. G. Parsons and his colleagues^{4, 5} classify the erythronoclastic anæmias into two main groups: (1) Those occurring in the neonatal period (first four weeks); and (2) Those occurring in later infancy and childhood.

Hæmolytic Anæmia of the Newborn (*Erythroblastosis neonatorum*).—This may occur: (a) With hydrops foetalis, a rare and rapidly fatal condition; (b) With icterus gravis, the most studied, commonest type, often familial; and (c) Without œdema or icterus gravis, again a rare condition. All these types occur in the early part of the neonatal period; but Parsons calls attention to (d) Hæmolytic anæmias occurring later in the neonatal period without œdema or icterus gravis, which in some cases present a picture similar to that of von Jaksch's anæmia.

Familial icterus gravis and its successful treatment by means of injections of maternal blood or serum have been commented on in recent volumes of the MEDICAL ANNUAL. The point of interest raised by Parson's work on these types is concerned with a theoretical matter—namely, if the erythroblastosis is to be regarded as a cause or a result of the disease. Parsons takes the former view and brings strong evidence in its favour.

Hæmolytic Anæmia of Later Infancy and Childhood.—The various types of this consist of acute, subacute, subchronic (von Jaksch), and chronic (acholuric jaundice).

The acute type of hæmolytic anæmia (Lederer type) has the appearance of being due to an infection, though no constant evidence of this cause can be elicited. The anæmia develops with extreme rapidity, and may be associated with jaundice and even hæmoglobinuria. So sudden is the onset of the anæmia that this, in the absence of obvious bleeding, is itself suggestive of its hæmolytic nature. **Blood Transfusions** may be of great value in tiding the child over the critical stages of the active disease: and in Parsons's series of 9 cases,

8 recovered. Recovery may be rapid, but may require the exhibition of iron to complete the cure. (See also ANÆMIA, ACUTE HÆMOLYTIC, OF LEDERER.)

The *subacute* cases show the same type of process, but the onset of the disease is less dramatically sudden.

Von Jaksch's anæmia, which has become so uncommon in recent years in England, remains a mysterious disorder; and it is of interest to read the arguments put forward by Parsons and Hawksley to support their view that it should be regarded as in reality a subchronic hæmolytic anæmia. They rely in part on tracing hæmolysis in the early stages of cases passing ultimately into the von Jaksch syndrome; and in part on other evidence of hæmolysis during the stage of established disease.

Achloruric family jaundice, a chronic form of hæmolytic anæmia, differs from other types of hæmolytic anæmia. For one thing, anisocytosis with microcytosis is characteristic; for another there is the well-known increased fragility of the erythrocytes. Probably the reason why jaundice is so much more conspicuous in achloruric jaundice than in other forms of hæmolytic anæmia is because in it there is not only a more constant but also a greater destruction of red cells. This is due to the fact that there the marrow is always active and turning out more cells than normal; whereas in the acute hæmolytic anæmias the marrow may be completely paralysed during the period of hæmolysis.

BIBLIOGRAPHY.—In the following list the first nine papers appeared as a series entitled "Studies in the Anæmias of Infancy and early Childhood" in the *Archives of Disease in Childhood* during 1933, and emanated from Professor L. G. Parsons and his colleagues at the Children's Hospital and the Department of Diseases of Children at the University, Birmingham: ¹L. G. PARSONS, "Introduction to the Study of Anæmia in Childhood", *Arch. of Dis. Childh.* 1933, viii, 85; ²L. G. PARSONS and E. M. HICKMANS, "The Effect of Yeast on Nutritional Anæmia in Rats", *Ibid.* 95; ³L. G. PARSONS and J. C. HAWKSLEY, "The Anhamatopoietic Anæmias (Deficiency Diseases of the Erythron): Nutritional Anæmia, and the Anæmias of Prematurity, Scurvy, and Celiac Disease", *Ibid.* 117; ⁴L. G. PARSONS, J. C. HAWKSLEY, and R. GITTINS, "The Hæmolytic (Erythronoclastic) Anæmias of the Neonatal Period; with Special Reference to Erythroblastosis of the Newborn", *Ibid.*, 159; ⁵L. G. PARSONS and J. C. HAWKSLEY, "The Hæmolytic (Erythronoclastic) Anæmias of Later Infancy and Childhood: with Special Reference to the Acute Hæmolytic Anæmia of Lederer and the Anæmia of von Jaksch", *Ibid.* 184; ⁶A. V. NEALE and J. C. HAWKSLEY, "Nutritional Anæmia in Mother and Child", *Ibid.* 227; ⁷R. GITTINS, "Monocytic Reaction in Myelosis", *Ibid.* 241; ⁸R. GITTINS, "Leukæmia (Leucosis) in Children", *Ibid.* 291; ⁹R. GITTINS, "Anæmia and Reticulo-endotheliosis", *Ibid.* 367; ¹⁰H. M. M. MACKAY, "Copper in the Treatment of Nutritional Anæmia in Infancy", *Ibid.* 145; ¹¹G. W. CALDWELL and R. H. DENNETT, "The Use of Copper and Iron in 100 Cases of Secondary Anæmia in Children", *Med. Jour. and Record*, 1931, March 16, 286; ¹²H. M. M. MACKAY, "The Normal Hæmoglobin Level during the First Year of Life; Revised Figures", *Arch. of Dis. Childh.* 1933, viii, 221; ¹³H. M. M. MACKAY, "Factors Causing Variation in the Hæmoglobin Level with Age in the First Year of Life", *Ibid.* 251; ¹⁴L. G. PARSONS, "Congenital Anæmia", *Acta Paediat.* 1932, xiii, 378; ¹⁵L. G. PARSONS, "The Deficiency Anæmias of Childhood", *Brit. Med. Jour.* 1933, ii, 631; ¹⁶S. H. CLIFFORD and A. T. HERTIG, "Erythroblastosis of the Newborn", *New Eng. Jour. Med.* 1932, ccvii, 105; ¹⁷H. JOSEPHS, "Mechanism of Anæmia in Infancy", *Bull. Johns Hopkins Hosp.* 1932, Oct., 185; ¹⁸K. OCHSENJUS, "Dietary Deficiency in Anæmia", *Deut. med. Woch.* 1932, June 24, 1015; ¹⁹R. J. L. O'DONOGHUE and L. J. WITTS, "Three Cases of Unexplained Anæmia and Pyrexia in Boyhood", *Guy's Hosp. Rep.* 1932, Oct., 457; ²⁰Med. Research Council, 1931, Sp. Rep. Ser. No. 157; ²¹*Proc. Roy. Soc. Med.* (Child. Sect.), 1933-4, xxvii, 113.

ANÆMIA, HYPOCHROMIC (Simple Achlorhydic Anæmia).

Stanley Davidson, M.D., F.R.C.P.E.

Nomenclature.—Innumerable names have been given to this syndrome since it was first described by Faber in 1913 (see MEDICAL ANNUAL, 1932, p. 38). In this country the name 'simple achlorhydic anæmia' has been generally adopted, consequent on the researches of Witts. It is doubtful if this title

can now be justified, since many cases secrete hydrochloric acid, with or without the injection of histamine. The name 'chronic microcytic anæmia' has been used by some workers for this syndrome, but investigation into the cell volume and diameter indicates that microcytosis is far from being invariably present. Blood iron studies, however, reveal the fact that hypochromia is invariably present, and hence the name 'idiopathic hypochromic anæmia' is probably the most suitable one available. The prefix 'idiopathic' is added to differentiate the hypochromic anæmia secondary to hæmorrhage or sepsis from an iron-deficiency anæmia occurring essentially in women, resulting from a combination of factors. The recognition of the frequency of this form of hypochromic anæmia in women of the child-bearing age, with its detrimental effects on health and its remarkable therapeutic response to large doses of iron, probably warrants its classification into a separate syndrome. Nevertheless, on scientific grounds, it is becoming increasingly difficult to justify its separation from other forms of iron-deficiency anæmias. Thus W. Dameshek¹ states: "It is therefore possible that primary hypochromic anæmia, with its various manifestations, may represent part of a greater syndrome of iron deficiency (hypoferrism), and that certain cases of anæmia which are definitely secondary may also be included in this syndrome, which may not have definite fixed characteristics." A. L. Bloomfield,² after a very careful review of the subject, concludes that chlorosis and idiopathic hypochromic anæmia cannot be differentiated into independent entities. The frequency of these types of anæmia in women is probably conditioned by menstrual bleeding. "Neither age, sex, symptoms, gastric analysis, hæmatological examination, nor response to iron therapy offers any tangible criteria for separating the two conditions."

Nutrition in Relation to Anæmia.—A large-scale investigation into the relationship of nutrition to anæmia was carried out by a team of Aberdeen workers,³ with the object of finding whether there was any correlation between the iron in the diet and the hæmoglobin level of the patient's blood: 455 adult females, 45 adult males, and 750 children between the ages of 5 and 14 were examined, and 115 families were submitted to a complete dietary survey. The results of this investigation showed that, whereas anæmia was present in a very small proportion of children and adult males, 47 per cent of females of the child-bearing ages showed some degree of anæmia, and 14 per cent of these were severely anæmic. It was obvious, therefore, that some function of womanhood must be the deciding factor in the production of the anæmia. The causes of the anæmia were established: (1) Increased demands for iron for hæmoglobin formation, due to blood loss, pregnancy, and lactation; and (2) Defective utilization and absorption of iron due to achlorhydria. Approximately 90 per cent of the anæmic women examined by test-meal were achlorhydric or hypochlorhydric, compared to 20 per cent of the non-anæmic group. The large-scale dietary survey clearly showed that the diets were quantitatively and qualitatively defective, compared to the generally accepted standards. Nevertheless no direct correlation was found between the iron content of the diet and the hæmoglobin content of the blood, since some individuals on an iron intake of one-third to one-half of the accepted standard (Sherman, 15 mgrm. of iron per day) were not anæmic. The iron requirement for women is obviously tidal; it corresponds with certain functions of womanhood, and at such times the iron requirements are much greater than when these functions are in abeyance. Diet may be said to play an important but indirect part in the production of anæmia, since iron-poor diets in time reduce the body stores of pigment complexes, which are the precursors of hæmoglobin, to a level which is insufficient to meet the hazards of life. The high incidence of

anæmia in women on iron-poor diets, as well as the response to treatment with iron medication without alteration of the diet, clearly indicates that the anæmia present is a nutritional deficiency disease.

Syndrome of Anæmia, Glossitis, and Dysphagia.—M. M. Suzman⁴ reports eight cases of the syndrome of anæmia, glossitis, and dysphagia (the so-called Plummer Vinson syndrome), together with the observations on one case which came to autopsy. Throughout the mouth, hypopharynx, and œsophagus, microscopic examination disclosed the condition of hyperkeratinization of the epithelium, together with desquamation and atrophic degeneration of the underlying muscle tissue. The intermuscular nerve plexus (Auerbach) revealed no abnormality, thus apparently ruling out the view that achalasia was the cause of the dysphagia. In addition the condition did not appear to be inflammatory. The author comments on the frequent occurrence of webs, bands, or raised folds of mucous membrane obstructing the œsophageal entrance, and suggests that the cause of the dysphagia is essentially due to these mechanical defects.

Diaphragmatic Hernia Associated with Secondary Anæmia.—K. D. Gardner⁵ summarizes the case histories of 22 previously published cases of diaphragmatic hernia associated with anæmia, and 6 previously unpublished cases of his own. The anæmia is secondary in type, being caused, it is thought, by venous oozing due to compression of the stomach by the diaphragmatic muscle.

TREATMENT.

1. Oral Administration of Iron.—The importance of giving massive doses of iron is again stressed by many workers (iron and ammonium citrate, 90 gr., or Blaud's pill, 45 gr., daily). Eighty-four cases of hypochromic anæmia selected from a much larger series and treated after adequate control periods, have been analysed by C. W. Heath⁶ in respect to the hæmatopoietic response to the oral administration of iron. Interesting information regarding the rate of response which might be expected and the percentage utilization have been worked out. An increase of 1 per cent hæmoglobin per day, when the initial hæmoglobin level is 50 per cent or less, should be produced by effective therapy.

2. Parenteral Administration of Iron.—C. W. Heath, M. B. Strauss, and W. B. Castle⁷ studied the effects of parenteral iron therapy in 17 cases of hypochromic anæmia. They found that 32 mgrm. of metallic iron when injected was approximately equal, from the point of view of blood-building, to 1000 mgrm. of iron by mouth (90 gr. of iron and ammonium citrate). Blood-iron calculations showed that the parenteral dose corresponded closely with the amount of iron gained in the circulation as hæmoglobin, indicating fairly complete utilization. It is obvious that the absorption of iron from iron and ammonium citrate, when given by the mouth, must be very poor when such large amounts are required. Since the optimal parenteral dose is very near the toxic dose, the authors state that it is undesirable to give iron by injection, since equally good results can be given by oral therapy, without any danger.

3. Copper and Manganese.—An excellent review of the influence of copper and manganese on the therapeutic activity of iron is recorded by J. H. Sheldon.⁸ It is extremely doubtful whether manganese plays any rôle in blood formation at all. Copper, on the other hand, is admittedly necessary for the proper utilization of iron for the synthesis of hæmoglobin. [Nevertheless the reviewer is satisfied, both from his own investigations and from a study of the literature, that with the possible exception of the nutritional anæmia of milk-fed infants,

copper is an unnecessary adjunct to iron therapy in the treatment of all forms of hypochromic anæmia in human beings. From studies of the dietaries of the poor, the reviewer found that normal blood-levels could be maintained on a copper intake of 3 mgrm. daily. Accordingly the traces of copper required for a catalytic effect will be invariably supplied by a mixed diet.—S.D.]

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ANÆMIA, PERNICIOUS.

Stanley Davidson, M.D., F.R.C.P.E.

TREATMENT.

The treatment of the different types of anæmia prevalent in Great Britain, including pernicious anæmia, was discussed at length at a joint meeting of the sections of Medicine and Therapeutics of the Royal Society of Medicine. For details the reader is referred to the published report.^{1,2} It is certain that equally successful results are obtained from oral administration of **Dried** or **Fluid Liver Extracts** or **Gastric Tissue Products**, provided potent preparations and adequate doses are employed. Reference was made in last year's issue of the MEDICAL ANNUAL, p. 31) to the fact that impotent preparations are still on sale. That inadequate amounts of the anti-anæmic principle are constantly being prescribed is the regular experience of the reviewer. As a direct result large numbers of individuals suffering from pernicious anæmia are carrying on their daily occupations with a subnormal blood-level, and such patients are particularly liable to develop subacute combined degeneration of the cord. This unsatisfactory position is mainly due to three causes: (1) The belief that $\frac{1}{2}$ lb. of liver and the extract made therefrom is the universal therapeutic dose. In actual practice the daily dose necessary to attain a normal blood-level varies in different patients from 100 to 1000 grm. of liver, or the extract made therefrom. (2) The failure to realize that the extract from $\frac{1}{2}$ lb. of liver is therapeutically equivalent to little more than a $\frac{1}{4}$ lb. of the fresh article. (3) The failure to undertake blood examinations at regular intervals in order to be sure that the quantity of active principle ordered may be adequate for the body needs. In practice it is found that the extract from 1 lb. of liver daily is usually required to raise the blood-level to normal. Contrary to the general belief, much larger amounts of active principle must be given to raise the blood-level from 3.5 to 5 million red cells than from 1 to 3 million. Ignorance of this fact is responsible for so many patients failing to attain blood-counts over 4 million red cells.

Considerable attention is now being paid to the economic side of the treatment of pernicious anæmia (S. C. Dyke and E. Harvey,³ L. J. Witts⁴). To those who are unable or unwilling to eat whole liver, the cost of treatment is heavy, and to many impossible. Fluid liver extracts are cheaper than the dried preparations and are as potent provided adequate amounts are taken. The failure of many manufacturers to produce more concentrated fluid preparations is a serious disadvantage, since the patient has to be continually obtaining a further supply if he is to take the potent material from 1 lb. of liver daily. Fish liver extracts are cheaper than mammalian-liver extracts and should be a decided help if certain difficulties connected with the supply of fresh livers can be overcome. Gastric tissue products made in this country at present offer the cheapest remedy available for oral therapy. They are insoluble in water and thermolabile, and hence must not be heated. Some preparations have a nauseating taste and smell; this can be considerably

reduced by exposing the dose to the air for twelve hours before ingestion. As shown by Wilkinson,⁴ there are still preparations on the market which are impotent.

Parenteral Liver Therapy.—In last year's MEDICAL ANNUAL (p. 30) the reviewer merely outlined the indications for and the advantages of this method. In the severe relapse stage, when the blood-count is in the neighbourhood of 1 million red cells, treatment by injection should always be the method of choice, because of the speed of blood regeneration which occurs. As a means of reducing or replacing the maintenance dose of liver in the stage of remission, parenteral therapy is of real value. The numerous publications of successful results in all countries make it certain that the injection treatment of pernicious anæmia has passed out of the experimental stage and must now be seriously considered as being the method of choice. Excellent reports by the following workers have appeared during the past year: H. M. Conner;⁵ A. E. Meyer, P. Richter, and A. C. Ivy;⁶ E. W. McHenry, E. S. Mills, and R. F. Farquharson;⁷ C. J. Fouts and L. G. Zerfas;⁸ Von M. Hofer;⁹ S. M. Goldhamer, R. Isaacs, and C. C. Sturgis;¹⁰ R. Isaacs, C. C. Sturgis, et al.¹¹ The last-named workers deserve special mention, since they give a very complete account of the effects and results of one thousand injections into 140 patients. The claim is made that the shock-producing substances in the material used for intravenous work can be removed by adding **Acetone** to the aqueous liver extract solution, to a concentration of 70 per cent, thereafter passing the material through permutite. No reactions were obtained in 150 consecutive intravenous injections. From the above reports and from his own experience the reviewer has come to the following conclusions:—

Liver extract may be injected intravenously or intramuscularly. The advantages of the latter route to the general practitioner are obvious. It is only in cases with a failing circulation and marked subcutaneous œdema, when absorption is very poor, that intravenous injection is required. Any pain at the site of intramuscular injection may be largely relieved by massage for a few moments, in order to distribute the fluid through the tissues. General reactions very rarely occur, and the speed of blood regeneration is very rapid. The slightly slower response obtained compared with that produced by intravenous injection is usually of little importance, except in cases which are desperately ill. Practitioners must remember that while preparations for intravenous use may be given intramuscularly, the reverse must never be done. Intramuscular preparations are considerably cheaper than intravenous ones since the latter must be subjected to an extensive process of purification. Effective preparations for intramuscular injection can be made very simply in any laboratory, since the active principle contained in liver extract (Fraction G, Cohn) has merely to be dissolved in distilled water, suitably buffered, and sterilized thereafter. Since this simple method does not concentrate the material, few of the preparations for intramuscular use contain more than the active principle from 5 to 10 grm. of liver per cubic centimetre. During the severe relapse stage a daily injection of the active principle from 20 to 50 grm. of liver should be given until a well-marked reticulocyte crisis has occurred. Thereafter an injection twice weekly is generally sufficient to raise the blood-count to normal. For maintenance purposes an injection once weekly or fortnightly may suffice, while in a few cases even longer intervals are satisfactory. The maintenance dose for parenteral injection varies in every case in the same way as does the oral dose. Not only do preparations made by different manufacturers vary in potency, but different batches made by the same firm show considerable variations in activity. Accordingly the only safe criterion to adopt regarding dosage is to rely on the information derived

from consecutive blood examinations. The importance of treatment on a quantitative basis, so that adequate supplies of potent material should be received by the patient to meet his optimal daily demands throughout life, is stressed by G. R. Minot¹² in a thoughtful paper which the reviewer recommends to all interested in the subject.

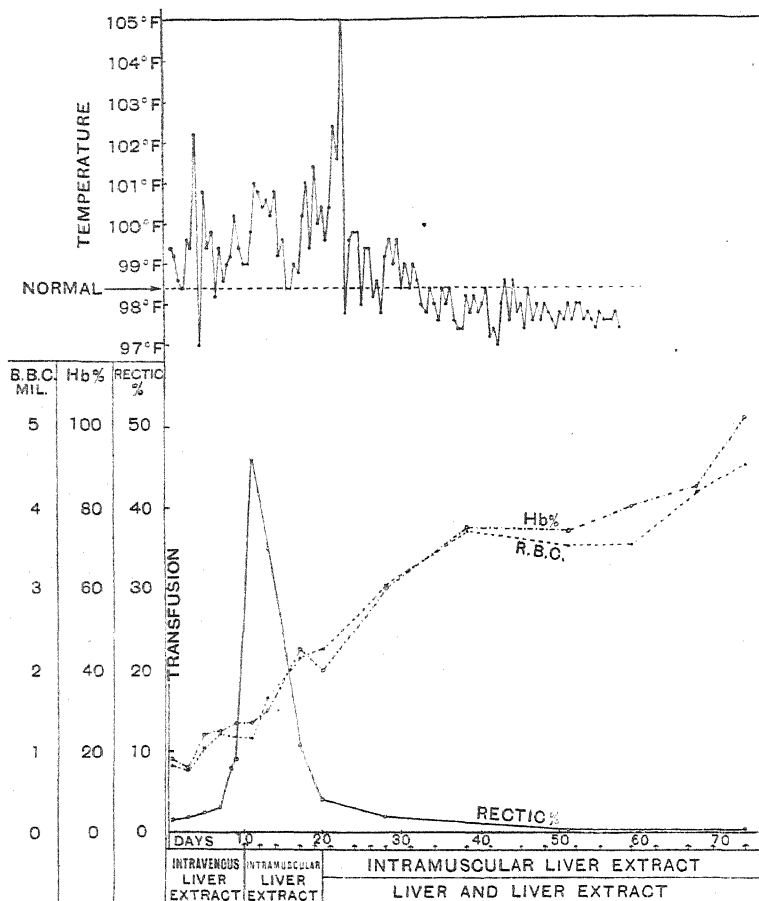


Fig. 2.—A case of pernicious anemia with double pneumonia and gangrene of the back successfully treated by parenteral liver extract therapy (Davidson). The effect of sepsis in preventing or delaying the action of the anti-anæmic principle contained in liver, when given by the mouth, is well recognized. The chart shows that parenteral injection of the active principle may be effective even in the presence of intense sepsis.

There are three important reasons which are inducing more and more of those who have made a special study of the treatment of pernicious anemia to suggest the replacement of oral therapy, wholly or partly, by parenteral. Eight years have passed since liver treatment became established, and large numbers of patients are alive to-day who previous to 1926 would have died. Many of these patients, through, ignorance, laziness, or inability, have been

taking insufficient quantities of potent material, with the result that subacute combined degeneration, once a relatively rare disease, is now of common occurrence. Since treatment of subacute combined degeneration, except in early cases, is unsatisfactory, prevention becomes of paramount importance, and the continuous maintenance of a normal blood-level offers the best hope in this direction. The need for adequate therapy based on repeated blood examinations is clearly evidenced by the statistics on cases of pernicious anæmia treated at the Royal Hospital, Wolverhampton.³ Of 52 patients treated within the last five years, 19 attended regularly after discharge for blood examination and advice, all of whom are alive and well. Of the 33 patients who failed to turn up regularly for examination, only 9 are in good health and 15 are dead. These figures clearly indicate the essential need for treatment based on regular blood examination, and require no further comment by the reviewer. The injection of liver extract at regular intervals, either as the sole method of treatment or combined with the ingestion of moderate amounts of whole liver, is probably the safest way to attain this object.

Secondly, from an economic point of view, parenteral therapy is probably twenty to thirty times as effective as oral treatment, and a weekly injection of the active principle is the cheapest method of treatment. There appears to be little reason why intelligent patients should not be taught to do this for themselves, in the same way that diabetics do.

Thirdly, parenteral therapy is of particular value in elderly patients who are resistant to oral treatment, either because of defective absorption of the specific anti-anæmic factor from the gastro-intestinal tract, or because of the inhibitory effect of chronic sepsis on blood regeneration. Even in the presence of intense sepsis immediate and full effects may be expected when the active principle is injected (Fig. 2).

Subacute Combined Degeneration of the Cord.—J. G. Greenfield and E. O'Flynn¹³ report a series of 45 cases of subacute combined degeneration of the cord. Achlorhydria was present in all cases. Anæmia, when present, conformed to the pernicious type, and 14 per cent of the cases had red-cell counts exceeding $4\frac{1}{2}$ million when first seen. Post-mortem examination revealed that the lesion of the posterior columns frequently antedates that in the anterior lateral columns by many months. (*See also article SUBACUTE COMBINED DEGENERATION OF THE SPINAL CORD.*)

Autolysed Yeast Products (Marmite).—Contradictory results regarding the therapeutic value of yeast products have been published. Thus, A. Goodall¹⁴ and C. C. Ungley¹⁵ report some successes when large amounts of marmite were administered daily, while M. B. Strauss and W. B. Castle,¹⁶ and J. C. Groen,¹⁷ using small amounts, recorded only failures, although the same quantity of marmite incubated with normal gastric juice was found to produce positive results. In a recent paper L. S. P. Davidson¹⁸ has reviewed all the case reports published by the various workers in this field, and has added information derived from the treatment of an additional sixteen cases of pernicious anæmia with marmite or alcoholic fractions made therefrom. The conclusions reached were that autolysed yeast products in their present forms should not be held to be substitutes for liver, liver extract, or gastric tissue preparations, because of the many failures, either absolute or relative, which occurred. Nevertheless sufficient evidence has been accumulated to show that autolysed yeast contains some active hæmopoietic principle.

The Nature of the Hæmopoietic Factor in Marmite.—From their investigations into the characteristics and distribution of the extrinsic factors present in different substances, both animal and vegetable, Strauss and Castle¹⁶ concluded that they correspond to those of vitamin B₁₂. The recently published work

of Lucy Wills,¹⁶ however, is definitely against this hypothesis. She found the following vitamin B preparations therapeutically inactive in the tropical macrocytic anæmia of Indian women: (1) Vitamin B₁ and B₄, made from rice polishings adsorbed on to china clay; (2) Vitamin B₂, made from egg-white, in a concentration seven times greater than the vitamin content of 30 gm. of marmite; (3) Large doses of dried yeast or water yeast extracts. The cases subsequently responded adequately to 30 gm. of marmite. Moreover, a case of pernicious anæmia treated with vitamin B₂ made from egg-white failed to react to the egg-white extract, either before or after incubation with 150 c.c. of normal gastric juice, although a subsequent response was immediately obtained from liver extract.

Confirmation of these findings has been obtained by independent investigation by J. C. Groen,¹⁷ of Amsterdam, whose unpublished results the reviewer has the privilege to report. The results of treatment in ten cases of pernicious anæmia may be summarized as follows: (1) Marmite (24 to 36 gm. daily) was inactive, but when incubated with 150 c.c. of gastric juice an immediate response resulted (4 cases). Autoclaving did not destroy the active principle. (2) Dried yeast in doses of 60 to 75 gm., either in the form of watery extracts or 50 per cent alcoholic extract, was inactive even when incubated with 150 c.c. of gastric juice. The patients immediately responded to marmite and gastric juice or to liver extract (4 cases). (3) Egg-white from twelve to twenty eggs, plus 150 c.c. of gastric juice, was inactive; a satisfactory response to liver extract subsequently resulted (2 cases).

Lastly, H. Chick and A. M. Copping²⁰ have shown that vitamin B₂ in watery yeast extracts is rapidly destroyed or inactivated by 70 per cent alcohol, whereas the active principle of marmite is both alcohol-stable and heat-stable.

For the above reasons it may safely be concluded that the hæmopoietic factor in marmite is not vitamin B₂. Since dried yeast, or watery extract of yeast, is therapeutically inactive, as a source of extrinsic factor, but autolysed yeast products are active, it follows that the active principle is manufactured during the process of autolysis, in which case it must be a protein breakdown product of the nature of a polypeptide. Further researches into its character are required before any definite conclusions regarding its composition can be arrived at. The specific anti-anæmic principle found in liver and liver extract is produced in the stomach from the interaction of a gastric ferment (intrinsic factor of Castle or hæmopoietin of J. F. Wilkinson²¹) on this protein breakdown product in the food ingested.

Addisin.—In last year's issue of the *MEDICAL ANNUAL* (p. 29) reference was made to the claims of the group of workers from Cincinnati, R. S. Morris, M. L. Rich, L. Schiff, et al.,²² that when the gastric secretion of men, dogs, swine, or cattle was suitably concentrated and given in a single injection, a remarkable response could be obtained in cases of pernicious anæmia. In a recent paper the authors state that 5 patients with pernicious anæmia have been treated with injections of concentrated human gastric juice, and 11 with concentrated swine gastric contents. In each case a reticulocyte crisis was produced and a satisfactory hæmatological response obtained. Unfortunately, adequate details of the cases are not given. The effects of addisin in cases of erythræmia, acholuric jaundice, and agranulocytic angina are also described. It is very necessary that independent evidence regarding the efficacy of this remedy should be provided. J. F. Wilkinson²³ has severely criticized this work.

Autolysed Liver.—W. F. Herron and W. S. McElroy²⁴ state that the autolysis of liver with N/50 hydrochloric acid for ten days greatly increases its potency. Eleven cases were treated, and the authors state that the potency

of the autolysed extract given by the mouth was approximately that of other liver preparations given parenterally. If this is correct, a real advance in therapy has been made. So far no published evidence confirming or disproving these claims has appeared. The reviewer applied the technique advocated by these authors to fish liver, but the results obtained failed to indicate that any increased potency had resulted.

Equine Liver Extract.—Meyer and Richter⁶ successfully prepared an extract from equine liver for parenteral injection, which was found to be entirely satisfactory in the treatment of ten cases of pernicious anæmia.

Fish-liver Extract.—The reviewer¹ has now successfully treated more than twenty cases of pernicious anæmia with fish-liver extract made from cod, haddock, whiting, monk-fish, and dog-fish. The speed of blood regeneration which resulted was remarkably rapid. The process has now been handed over to a manufacturing firm. The technical difficulties which occur when a small-scale laboratory process is turned into a large-scale manufacturing process have now been successfully overcome. The manufacturers, however, have found difficulty in supplying the demands which have been made for fish-liver extract, owing to difficulties in obtaining adequate supplies of fresh fish liver.

ANÆMIA FOLLOWING GASTRIC OPERATIONS.

Janet Vaughan²⁵ reviews the literature carefully, and says that only 122 cases of anæmia following gastric operations have been published, with adequate information regarding the blood condition. Three cases of hypochromic microcytic anæmia following gastric operations are recorded by the author. R. A. Rowlands and S. L. Simpson²⁶ briefly review the history and special features of 15 cases of pernicious anæmia following gastric operations, which they collected from the literature, and add two cases under their own care of pernicious anæmia with subacute combined degeneration following partial gastrectomy. They conclude that pernicious anæmia is extremely rare after gastrectomy or gastrojejunostomy, although secondary anæmia is not uncommon. [While the reviewer is in general agreement with this statement, it is probable that there are more cases of pernicious anæmia following gastric operations than a study of the literature leads one to believe. The reviewer himself has had two such cases under his charge, one with subacute combined degeneration, in addition to several cases of hypochromic anæmia following gastro-enterostomy; this must be the experience of other clinicians as well.—S.D.]

MACROCYTIC ANÆMIA IN ASSOCIATION WITH OTHER DISEASES.

M. M. Wintrobe and H. S. Shumacker²⁷ show that in a proportion of cases of liver disease, such as cirrhosis of the liver, a macrocytic anæmia may be found which is definitely not pernicious anæmia. The macrocytosis is uniform and there is little anisocytosis. A clear-cut response to liver therapy is not usually obtained. The authors suggest two possible causes for the macrocytosis: (1) Impaired storage of the hæmopoietic principle, due to liver disturbance; (2) Distortion of the circulating erythrocytes by the physical or chemical action of the jaundice, or retained metabolic products.

The Coexistence of Diabetes and Pernicious Anæmia.—H. F. Root²⁸ reports 31 cases in which pernicious anæmia and diabetes mellitus coexisted, in addition to 48 cases previously reported. Likewise E. M. Watson²⁹ has noted this coexistence in three of his own patients and has found 79 cases in the literature. Diabetes was apparently the first to develop in 24 cases in Root's

series. The occurrence of anæmia in diabetic patients is fairly frequent, and it may remain of uncertain type for a considerable period before developing the characteristic features of pernicious anæmia.

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1933, March, 26; ²*Ibid.* 17; ³*Lancet*, 1933, ii, 59; ⁴*Proc. Roy. Soc. Med.* 1933, March, 17; ⁵*Jour. Amer. Med. Assoc.* 1932, Aug., 613; ⁶*Arch. of Internal Med.* 1932, Oct., 538; ⁷*Canad. Med. Assoc. Jour.* 1933, xxviii, 123; ⁸*Arch. of Internal Med.* 1932, Aug., 27; ⁹*Manch. med. Woch.* 1932, Aug. 19, 1351; ¹⁰*Amer. Jour. Med. Sci.* 1933, July, 84; ¹¹*Jour. Amer. Med. Assoc.* 1933, March 4, 629; ¹²*Ibid.* 1932, Dec. 3, 1906; ¹³*Lancet*, 1933, ii, 62; ¹⁴*Ibid.* 1932, ii, 781; ¹⁵*Quart. Jour. Med.* 1933, vii, 381; ¹⁶*Lancet*, 1932, ii, 111; ¹⁷Personal communication received on July 17, 1933; ¹⁸*Brit. Med. Jour.* 1933, ii, 481; ¹⁹*Lancet*, 1933, 1283; ²⁰*Biochem. Jour.* 1930, xxiv, 932, 1744; ²¹*Lancet*, 1933, ii, 629; ²²*Ann. of Internal Med.* 1933, June 15, 35; ²³*Brit. Med. Jour.* 1932, ii, 1163; ²⁴*Jour. Amer. Med. Assoc.* 1933, April 8, 1084; ²⁵*Lancet*, 1932, ii, 1264; ²⁶*Ibid.* 1202; ²⁷*Bull. Johns Hopkins Hosp.* 1933, June, 387; ²⁸*New Eng. Jour. Med.* 1933, April 20, 820; ²⁹*Canad. Med. Assoc. Jour.* 1933, xxix, 11.

ANÆMIA OF PREGNANCY.

Stanley Davidson, M.D., F.R.C.P.E.

The conclusions reached by M. B. Strauss and W. B. Castle¹ from their investigations into the anæmia of pregnancy may be summarized as follows: Gastric analysis made upon 24 women during pregnancy and the puerperium showed that 75 per cent of the patients did not secrete normal amounts of free hydrochloric acid or pepsin during the latter half of pregnancy. After delivery 80 per cent of the patients secreted a higher concentration of hydrochloric acid in the gastric juice than during pregnancy. Anæmia in pregnancy occurs particularly during the last trimester, consequent on the foetal drain upon the maternal organism for blood-building, muscle-building, and storage material. The hypochromic anæmia of pregnancy is due either to direct dietary deficiency, or to a deficiency conditioned by gastric anacidity, hypoacidity, or associated defects in the presence of foetal demands for blood-building material. The macrocytic anæmia of pregnancy is due to a temporary lack in the gastric juice of the specific anti-anæmic factor. The etiological mechanisms involved, therefore, are the same as those causing similar types of anæmia not associated with pregnancy, and respond to the same therapeutic measures. The importance of the pregnant woman taking a diet rich in proteins and iron-containing foods for the prevention of anæmia is stressed.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1933, April, 539, Nov., 655.

ANÆMIA, SICKLE-CELL.

Stanley Davidson, M.D., F.R.C.P.E.

It is generally believed that the presence of sickle cells in the blood occurs only in the negro race or in those with an admixture of negro blood. But S. Rosenfeld and J. B. Pincus¹ give full details of a white family in which three generations show this condition.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1932, Nov., 674.

ANÆMIA, SPLENIC. (See SPLEEN, SURGERY OF.)

ANÆSTHESIA. (See also ABDOMINAL SURGERY—LOCAL ANÆSTHESIA IN; ELECTROCARDIOGRAPHY.)

J. Blomfield, O.B.E., M.D.

A new barbiturate compound, **Evipan Sodium**,* first made and used in Germany, has been tried in this country and reported on by the Anaesthetics Committee of the Research Council and the Royal Society of Medicine.¹ It is the sodium salt of N-methyl-C-C-cyclohexenyl-methylbarbituric acid and dissolves freely in water, but the solution is stable only for a few hours. The

*Bayer Products Ltd., Africa House, Kingsway, London, W.C.2.

anæsthetic action of this drug is extremely rapid but also very short-lived. Thus its great use is for short operations. It can only be effectively given by intravenous injection. Evipan is supplied in powder form in ampoules to which the distilled water from another ampoule is added. About 3 c.c. of this solution is an average dose, but the anæsthetist is advised to settle the dose by results observed while he injects at the rate of 1 c.c. every fifteen seconds. The patient is usually asleep after 3 c.c. have entered the vein. If he is asked to count aloud,² when the counting ceases through sleep the amount already injected is noted. The same amount is further injected if the operation is to be short, and twice the amount if it is to be long. In elderly or feeble people, or those who have gone to sleep unusually quickly, only half the amount which induced sleep is added. Induction is generally quiet and unaccompanied by unpleasant sensations. Occasionally there is restlessness,³ and for this reason it is wise to have the arm steadied by a third person. Most persons are asleep within a minute. There is often a little twitching or jactitation, but complete relaxation of the jaw generally occurs early and must be provided for to avoid all obstruction to breathing. A deep yawn just before consciousness goes is a common symptom. The pupil is generally moderately dilated, but active to light. Conjunctival and corneal reflexes are gone at the height of anæsthesia, but even then there may be reflex movement on incision. Sometimes the eyelids are widely separated. There is commonly a slight fall in blood-pressure and some slowing of respiration. The maximum dose for a single injection is 10 c.c. Those who have used the drug for long operations leave the needle in position and reinject when anæsthesia is obviously passing off. Used in this manner, as much as 30 c.c. have been injected. For operations, however, which can not be completed in a few minutes there does not appear to be any particular advantage in evipan, except perhaps its rapid action and the rarity of after-effects. The length of time of unconsciousness is ten to twenty minutes after an average dose. The patient can then talk, but drops off to sleep again if left quiet. When he finally wakes he remembers nothing after the first prick of the needle. Evipan, unless preceded by a narcotic as recommended by some,⁴ cannot be relied on for an absolutely motionless anæsthesia in all subjects. Nevertheless it is an admirable drug for short proceedings in which unconsciousness is wanted but absolute stillness is unnecessary. Apart from anæsthesia, it has great use as a drug with which to break the habit of sleeplessness. For this purpose it is given by the mouth in the form of capsules. Biochemical investigations of patients after injection of evipan prove it to be free from deleterious effect on the metabolism of the body. It may therefore be regarded as a safe anæsthetic when properly used for suitable cases.

Sodium Soneryl,* a barbituric compound closely allied to nembutal, but less toxic, is favourably reported on after 150 patients had received the drug as a preliminary narcotic.⁵ It has the advantage of being effective in simple oral administration, the usual dose being from four to six capsules, i.e., 0.6 to 0.9 gm. This is given an hour before operation, and atropine half an hour later. Most patients are asleep by the time they reach the operation, and if not so, at any rate they are drowsy or calm and indifferent. The sleep after operation is not excessive, and, as with most of the barbiturates, a certain number of patients were restless. This symptom, however, is easily controlled by morphia. In a few instances there was some depression of breathing. No other objectionable effects were recorded.⁶ French authorities prefer to give soneryl on the evening before as well as an hour before operation. The effects,

* May & Baker, Ltd., Battersea, London, S.W.11.

advantages, and contra-indications of most of the barbiturates when used as basal narcotics are well set out by Gilbert Brown.⁷ The very latest, *civipan* and *soneryl*, however, do not come within his survey.

Pernocton, although more favoured on the Continent than in this country, is still much used by some anæsthetists in preference to the other barbiturates. It is of some importance, therefore, to realize the great value of **Coramine** when unfavourable symptoms, circulatory or respiratory, arise in association with this basal narcotic. The use of coramine in these circumstances is stated⁸ to be as effective as it is in the same conditions during the employment of *avertin*. After five years' experience and nearly 900 cases Schley⁹ regards *pernocton* as a safe basal narcotic if due care is exercised in determining the dose.

Coramine is also recommended as a prophylactic against lung complications after **Avertin**.¹⁰ For this purpose it is given by intramuscular injection before the end of operation. A review of the clinical and experimental evidence

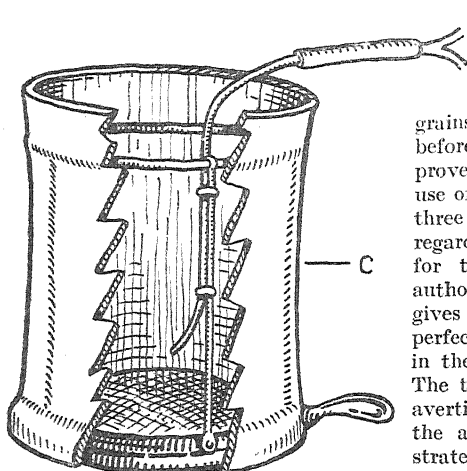


Fig. 3.—Section of mask made up, indicating lead-in tube. *a*, To CO₂ cylinder; *b*, To O₂ cylinder; *c*, Section of motor-car inner tube. (Re-drawn from the 'British Medical Journal'.)

regarding *avertin*¹¹ leads to the statement that there is no contra-indication to the use of this drug if the dose is carefully calculated. Ten grains of **Chloretone** on the evening before the operation morning have proved a valuable aid to successful use of *avertin* in gynaecology. After three hundred cases the authors¹² regard *avertin* as the ideal anæsthetic for this class of surgery. Other authorities¹³ think that *avertin* easily gives rise to danger if there is not perfect function of liver and kidneys in the patients on whom it is used. The transient nature of the effect of *avertin* on the blood-sugar and on the alkali reserve has been demonstrated, and one author¹⁴ believes the combination of *avertin* and nitrous oxide to be the best and safest means of general anaesthesia now available.

Novel details in the administration of **Rectal Oil-Ether** are said considerably to enhance the merits of this method.¹⁵ The instillation is made drop by drop. In addition 20 c.c. of oil of camphor are added to the mixture of 100 c.c. ether and 75 c.c. of olive oil.

An apparatus for giving rectal oil-ether has been designed¹⁶ and used with the idea of extending the popularity of this method in obstetrics. The Gwathmey method is simplified by omitting the magnesium sulphate, and the patients' comfort rather than the size of the os is the criterion for the time of making the injection.*

An apparatus for administering accurate mixtures of **Oxygen and Carbon Dioxide** gases is described.¹⁷ It works on the flowmeter system and is said to be simple, portable, and cheap to work.

A method of anaesthesia¹⁸ which its author describes as *rehalational* is a cross

* The apparatus may be obtained from the Wm. H. Armstrong Co., 233, N. Pennsylvania Street, Indianapolis, Indiana, U.S.A.

between perhalation with the open mask and rebreathing into a bag. Its features can be understood from the illustration (*Fig. 3*).

The carbon dioxide absorption method which we described fully last year is gaining favour, and two types of apparatus—the to-and-fro and the circuit—are demonstrated¹⁹ in an article which goes fully into the principles of the system.

An investigation²⁰ of the diffusibility of **Nitrous Oxide** reveals that the gas diffuses through rubber and also through skin. Under anæsthetic conditions it diffuses through skin twenty times as fast as ethylene.

The *explosibility of mixtures* of nitrous oxide, oxygen, and ether is drawn attention to apropos of an accident which cost the anæsthetist his life.²¹

As is well known, the exposure of ether to light and air easily leads to the formation of peroxides and aldehydes. These are generally regarded as undesirable constituents of an inhaled anæsthetic, chiefly because of the damage they may cause in the respiratory tract. Any substance therefore is valuable which, if added to ether, will in no way interfere with its action as an anæsthetic but will at the same time render it unlikely to suffer decomposition. Hydroquinone²² has now been shown to be such a substance: 1 part to 5000 parts of ether is sufficient, and excess is harmless. Hydroquinone is odourless and non-volatile, and harmless to the patient.

A discussion on anæsthesia in *cranial operations*²³ revealed the notable change which has taken place in cerebral surgery regarding the length of time commonly required for these operations. Anæsthetic methods have had to change in accordance with the present-day demand of two, three, four, and more hours for the performance of an intracranial operation. The chloroform and the ether which were satisfactory for Horsley and for Sargent are replaced by combinations of basal narcotics and gas and oxygen, or the former and local anæsthetics. Anæsthesia for *oral surgery*²⁴ resolves itself according to two authorities into endotracheal methods for major surgery, and regional for tooth extraction and similar procedures.

The special value of local and spinal methods in *surgery in the tropics* is pointed out.²⁵

Perhaps the greatest pitfall for the anæsthetist that he ever meets is *myocardial degeneration* without obvious heart failure. It is pointed out²⁶ that the state may be suspected with a heart of normal size and no back pressure if the sounds are not clear or the first sound is blurred and the general appearance is sallow or cyanosed. A history of nocturnal dyspnoea, of unexpected collapse or fainting, or shortness of breath on exertion or speaking is also highly suggestive of muscular weakness of the heart. When this is suspected the extra danger of anæsthetics should be pointed out before operation. Generally speaking the anæsthetic to choose is ether with oxygen, by gradual administration.

Based on biochemical investigations, a treatment for *toxic symptoms after ether* is outlined and illustrations given of its successful employment. **Insulin** administration is the chief feature of the treatment, and the association of increase of blood sugar with decrease of blood-pressure the biological fact on which the treatment is based.²⁷

A method and apparatus for the securing of *closed endobronchial anæsthesia* (*Fig. 4*) are described.²⁸ With the use of these the shock on sudden creation of an open pneumothorax is almost abolished, and the method promises to be most valuable in removal of mediastinal growths, lobes of the lung, and the like.

A mixture called **Balsoforme** has given satisfaction in France. It is Schleich's formula, i.e., ether six parts, chloroform two parts, ethyl chloride one part, with the addition of a respiratory antiseptic called gomenol.²⁹

Insufficient attention is generally given to *posture both during and after anæsthesia*. An excellent article³⁰ illustrates the correct positions for various operations and during after-treatment. Neglect of this matter has often led to discredit.

Comparing the risk of local with that of general anæsthetics a French author³¹ lays stress on the trouble which may be caused by the former drugs in their

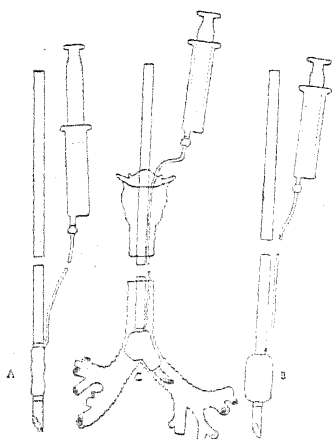


Fig. 4.—Apparatus for closed endobronchial anæsthesia in thoracic surgery. A, Catheter with surrounding rubber balloon collapsed; B, Balloon inflated; C, Catheter in place and balloon inflated, completely blocking bronchus on side of operation and ensuring non-leak contact of airway in opposite bronchus. (After Gale and Waters.)

elimination by the kidney, and suggests that this is no less formidable than the troubles which may arise through elimination of general anæsthetics through the respiratory system. *Intestinal obstruction* often causes anxiety to the anæsthetist, chiefly through the dangerous profuse regurgitation of fluid which occurs so often and so easily in those being operated on for this condition. Whatever method of anæsthesia is employed the opinion is given³² that safety is best secured by passing a stomach tube, washing out the stomach both before and during operation, and keeping the tube in position till the patient is returned to bed.

Latent jaundice after operation:³³ An investigation of the bilirubin of the blood serum in 128 patients led to the discovery that in a large proportion of the patients there was a marked increase in the bilirubin of the blood. This was at its height on the second day after anæsthesia and gone after the tenth. The condition was present in 78 per cent of those who had a chloroform-ether mixture and in 41 per cent after ether.

The way in which ether vapour can be used throughout the *dissection of tonsils in children* is described³⁴ as it is employed at Great Ormond Street.

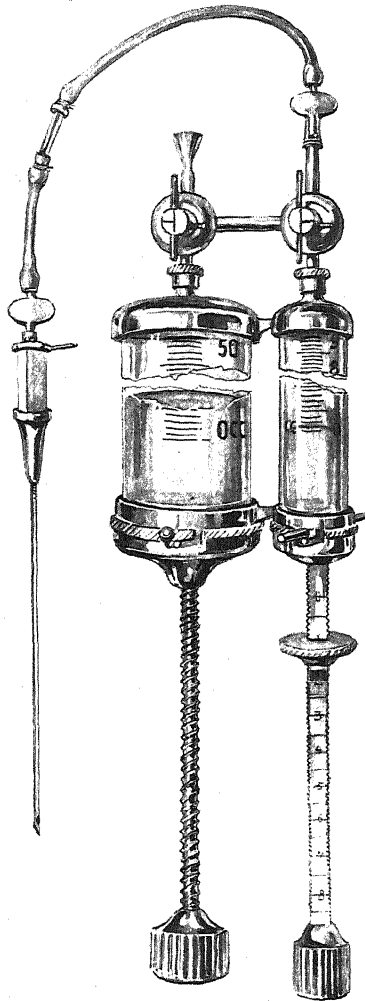
The discussion at the British Medical Association's meetings on *anæsthesia for abdominal operations* revealed considerable difference of opinion.³⁵ This is inevitable since the requirements of different operators are so different. Whereas the man who operates very quickly is well served and gets good results from deep open ether, this is not true of long abdominal operations. For these some form of local analgesia must play a large part in securing insensibility. Combined with avertin and with gas and oxygen this method seems at present the best available. With regard to the onset of *lung complications* after these operations, stress is laid on the importance of neither the patient nor anyone taking part in the operation having any affection of the nose or throat at the time. The prevalence of these complications during influenza epidemics, for example, is notable.

That formidable and mysterious complication of ether anæsthesia, *convulsions*, is considered by Kemp³⁶ to be a consequence of alkalosis consequent on excessive riddance of CO₂. This author recommends the **Perfusion of the Coronary Arteries** as the most effective restorative in the presence of heart failure in anæsthesia; 25 c.c. per kilo of body weight of a solution of $\frac{1}{4}$ c.c. saturated **Calcium Chloride** to 1000 c.c. **Normal Saline** are to be perfused by way of the brachial or carotid artery.

PLATE I

SPINAL ZONE ANÆSTHESIA

(M. KIRSCHNER)



The double syringe for spinal anæsthesia. The large syringe is for the aspiration of the cerebrospinal fluid and for the injection of air into the dural sac. The small syringe serves the purpose of injecting the anæsthetic charge. The stopcocks of the larger and smaller syringes control the outlets. The rubber tube and the cannula are joined by means of airtight bayonet pieces. The rubber tube is provided with a capillary glass tube so that the passage of air or fluid may be observed.

By kind permission of 'Surgery, Gynecology and Obstetrics'

SPINAL ANÆSTHESIA.

*Segmental peridural spinal anæsthesia*³⁷ should offer great advantages both of safety and of precision. Moreover, it is as applicable to higher portions of the body as it is to the lower, which is of course not true of spinal analgesia due to intrathecal injection. The anatomical facts on which the method depends are set out and the technique is described. The latter certainly requires considerable practice, the difficulty being to determine when the needle is in the peridural space—that is, through the interspinous ligament but not through the dura. The author's plan for finding this out is by injecting saline. This passes in easily enough when the space is reached, but has to be forced in with much strength while the needle is still outside the space in the tough ligamentous tissue. Should the dura be pierced, this is shown by flow of cerebrospinal fluid. The author, who writes after experience of 300 cases, recommends the method particularly for severe operations on the upper abdomen. The fall of blood-pressure and the vomiting which often mar a spinal anæsthesia are rarely witnessed after peridural injections. **Tropacocaine**, not often used in this country, is regarded by some American authorities³⁸ as the best of all spinal anæsthetics. An account is given of a series of 1000 administrations.

The use of the *patient's serum*, or of *Bayliss' acacia formula*,³⁹ as solvent for the anæsthetic drug is said to reduce the possibility of affecting cardiac nerves, or those supplying muscles of respiration.

Spinal Zone Anæsthesia.—A new method of inducing spinal anæsthesia, by means of which the anæsthetic solution can be placed at will in a definite segment of the spinal cord and maintained there, is introduced by Professor Kirschner, of Tübingen.⁴⁰ He maintains that in addition the dose is not given in the routine fashion of ordinary spinal methods but is regulated to the individual patient much as in ether inhalation.

These advantages are attained in the following way. With the patient placed so that the head is low and the buttocks are elevated a spinal puncture is made and a certain amount of cerebrospinal fluid removed and replaced by the same volume of air. The air-bubble collects in the highest portion of the dural sac within the sacral bone. An anæsthetic solution which is lighter than the fluid, and, being oil-like, is not miscible with it, is injected into the dural sac. The solution will naturally collect and take its place between the cerebrospinal fluid and the air-bubble. Because it is lighter than the cerebrospinal fluid it cannot spread towards the head and it cannot pass towards the sacrum because of the lighter air. Because the separation into the three layers will take place slowly if dependent only on the slight differences of gravity it is aided by another procedure. The anæsthetic solution is injected through a special cannula armed with a lateral opening just before the point. The solution can be projected a considerable distance towards head or sacrum by turning the lateral opening in the required direction. Only those spinal roots which pass through the layer of the anæsthetic solution will become anæsthetized. The roots corresponding to the layer of air or of cerebrospinal fluid will not be thus affected. Rather than introduce the calculated dose at once, one may begin with a smaller dose, testing the skin sensibility and adding more anæsthetic if necessary, thus securing the desired depth of anæsthesia in stages and giving each patient the minimum amount of the drug. Controllable spinal zone anæsthesia with individually determined dose is thus secured. Special apparatus is required (*Plate I*).

The puncture is made with the patient on the side. For upper abdominal operations it is made between the 1st and 2nd lumbar spines and for other operations lower than this, and never at a higher space. As a rule about 25 c.c.

of air are injected. The largest amount hitherto used has been 35 c.c. The author has used the method for 500 laparotomies, 270 in the upper abdomen. The anæsthetic solution used was **Percaine** in a buffered solution of alcohol and dextrin, lighter than the cerebrospinal fluid. From 2 to 3 c.c. of the solution have sufficed; that is, from 2.5 to 7.5 mgrm. of percaine. Fall of blood-pressure is only rarely observed. High pressure local anæsthesia is used as a supplement when dragging in the upper abdomen causes discomfort.

Few patients, says Fairlie,⁴¹ are able to go through the ordeal of a major operation in a state of normal consciousness. Using percaine for spinal analgesia he precedes it as a routine by $\frac{1}{4}$ gr. of **Morphia** and $1\frac{1}{2}$ to $4\frac{1}{2}$ gr. of **Nembutal** by the mouth, half an hour before operation. Generally a fairly deep sleep, and always amnesia, is thus produced. There is with this preliminary less fall of blood-pressure than with other narcotics.

One thousand spinal anæsthesias⁴² with no death on the table or within three hours of operation are recorded. Mortality details are given showing none that could probably be attributed to the anæsthetic.

Investigating the *nervous sequelæ of spinal anæsthesia*, Ashworth examined 650 cases.⁴³ There was one regarded as meningitis and one of paresis, both fatal. He found that minor symptoms or lesions are not infrequent, and are often persistent, but that there are a large number of instances in which the nervous symptoms present are due to organic disease entirely unrelated to the anæsthetic. It is therefore of great importance that every patient having nervous symptoms attributable to an antecedent spinal anæsthetic should undergo a thorough examination.

Percaine has been used successfully⁴⁴ for cervico-dorsal spinal analgesia, thyroidectomies and similar operations being performed. It is maintained that greatly increased safety, particularly for operations on the upper portions of the body, is obtained by combining with the percaine 1 c.c. of **Cardiazol-ephedrine**.⁴⁵

Good results in high abdominal operations have been obtained by Falkner Hill⁴⁶ with an injection of the same specific gravity as the usual stovaine-glucose, but consisting of **Planocaine** 0.1 gm. per c.c., **Gladin** 0.00325 gm. per c.c., **Glycerin** 0.12 gm. per c.c., in 15 per cent alcohol.

The satisfactory use of percaine spinal analgesia⁴⁷ for high laparotomy in infants is recorded.

One authority⁴⁸ states that, contrary to general opinion, children require as preparation for spinal analgesia relatively large doses of sedative drugs, and tolerate them well.

After experimental investigations Seevers and Waters⁴⁹ make some trenchant criticisms of the usual explanation of low blood-pressure during spinal analgesia, and also of the use of this method for anæsthetizing upper parts of the body. They do not believe that it is as safe as declared by Koster, to rely on the anæsthetic having a selective action on the sensory and not affecting the motor nerves.

One neurologist⁵⁰ maintains that there is a definite toxic effect on spinal cord and nerve-roots from spinal anæsthetics. His conclusions are based on the study of pain in individuals after spinal injection and of nerve-roots post mortem. A case recorded by another author⁵¹ appears perhaps to confirm this idea. The diagnosis here was chronic adhesive meningitis after spinal injection.

The technique of Quarella⁵² in using percaine is approved by some French authorities in preference to the method introduced by Howard Jones. It consists essentially in a strong solution, 5 parts per 1000, of which only 1 or 2 c.c. are injected. The patient is not placed face downwards after injection as is necessary with Jones's technique.

As a result of long research into the pathogeny of *headache* after spinal puncture the authors⁵² recommend administration of **Calcium Lactate** 4 to 8 gr. a day for three to eight days, and also **Ephetonin** or **Ephedrine**, both of which act more quickly than the calcium.

Epinephrin is recommended for use both intravenously and locally in the peritoneal cavity for circulatory failure during spinal analgesia. Eight to fifteen drops in 100 c.c. normal saline are poured into the abdomen.⁵⁴

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ANÆSTHESIA, LOCAL, IN RHINO-LARYNGOLOGY.

F. W. Watkyn-Thomas, F.R.C.S.

Several papers of importance have recently appeared on this subject. It is clear from a study of them that local anæsthesia even in the most expert hands is not free from difficulty or danger.

Fatalities due to Injection of Novocain.—T. Seeger¹ deals with this subject and analyses 66 cases, 2 of them his own. Of his own cases, one was a peritonsillar infiltration for tonsillectomy, the other an infiltration of the neck tissues for a plastic operation on the larynx. In 53 per cent of the collected cases the injections were made into the pharynx and neck; in 35 per cent the injection was made for tonsillectomy. Seeger, from his examination of the records, excludes status lymphaticus as a cause of the fatalities. He regards the amount of novocain injected as unimportant, and can find no evidence for attributing the blame to puncture of veins, the combination with adrenalin, or the use of preliminary medication with alkaloids. He points out that slight mechanical injuries in the neck can cause sudden death by some reflex through the vagus, the superior laryngeal, or the sinus caroticus. The immediate cause of death is auricular fibrillation; similar phenomena are the 'pleural shock' which sometimes follows puncture of the pleura, and the sudden death which may follow a blow over the semilunar ganglion. His view is that these fatalities in neck and pharyngeal injections are due to such a reflex, especially to irritation of the sensory fibres from the sinus caroticus which join the glossopharyngeal at the base of the skull, and are said to be a main afferent path for vasomotor reflexes in this region.

Cocaine Poisoning.—E. Leschke,² in an article on cocaine poisoning, describes the signs, psychical disturbances, and treatment in acute poisoning and in chronic addicts. In acute poisoning he first attempts removal of any

cocaine still unabsorbed by lavage of the nose, mouth, and stomach. The fluid for stomach lavage is made much more efficacious if powdered charcoal is added to it. It is a mistake to give morphia injections in order to allay the muscular excitability and convulsions, as morphia increases the liability to respiratory paralysis. Intramuscular injections of such substances as **Luminal**, **Pernocton**, or **Dial** are better and safer. Threatened respiratory paralysis demands injection of **Lobeline**, and flagging of the heart should be met with **Coramine** or **Cardiazol**.

Unusual Accidents under Local Anæsthesia.—P. G. Gerlings³ describes twelve cases of *facial nerve paralysis resulting from local anæsthesia for tonsillectomy*. In Professor Burger's clinic, where the author works, local anæsthesia of the tonsil is made by a single injection into the parapharyngeal space. In these cases the paralysis was always unilateral and was usually confined to the ramus marginalis mandibulæ, which runs through the parotid fascial compartment. This space, as is recognized, communicates with the parapharyngeal space through an opening in the deep fascia (Klestadt's "open spot of the parotid fascia"). The paralysis quickly passes and no permanent ill effects have been observed. In all cases the motor branch from the vagus to the soft palate is paralysed, and in one case sympathetic paralysis was seen.

Broken Needles.—H. Neumann,⁴ who uses a curved needle for his tonsil injections, reports a case in which the needle broke and was swallowed before he could catch it with his forceps. In thirty-six hours the needle was passed *per vias naturalis*. The point which Neumann particularly emphasizes is this: although one tonsil was already anæsthetized and the anæsthetization of the other had begun, he abandoned the operation at once, because the best line of treatment for such a foreign body is a diet of cabbage, potato, etc., and it would, of course, be impossible to give such a diet after tonsillectomy.

Cocaine Substitutes.—J. Koch⁵ deals with the value of cocaine substitutes. Alypin, psicaine, and tutocain are apparently not much used now. Percaine produces excellent anæsthesia in a 2 per cent solution, but the high toxicity of the preparation is against it. Two novocain derivatives, **Larocain** in 5 to 10 per cent solution, and **Pantocain*** in 1 to 2 per cent solution are recommended by Koch. Neither has any vasoconstrictor effect, so they must be used with adrenalin.

The test for surface anæsthetic effects are made by applying the different substances to the cornea of rabbits; a rough measure of the efficiency is the duration of the loss of corneal reflex.

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ANEURYSM, CIRROID, OF RECTUM. (See RECTUM, CAVERNOUS ANGIOMA OF.)

ANEURYSM, SUBCLAVIAN. (See BLOOD-VESSELS, SURGERY OF.)

ANEURYSMS, CEREBRAL. *Macdonald Critchley, M.D., F.R.C.P.*

In recent years, more especially in this country, considerable interest has been aroused in the problems of the origin, nature, and symptomatology of cerebral aneurysms. It is difficult to be sure whether there is an actual increase in their frequency or whether a greater knowledge has merely focused

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attention upon them; certainly, however, aneurysms of the brain and their attendant complications now occupy an important position in every-day medical practice.

CLASSIFICATION.—Intracranial vascular malformations are of diverse types, but we may exclude from this survey the neoplastic varieties (hæmangioblastomata, venous or arterial angiomata) as well as those of traumatic origin. Nor need we here discuss the miliary aneurysms of Charcot (*see* p. 54). Our concern will rather be with the aneurysmal dilatations encountered upon the larger arteries lying at the base of the brain. These we may divide into three pathologico-etiological groups: (1) Arteriosclerotic; (2) Syphilitic (rare); and (3) A group of uncertain nature, usually described as 'congenital'. The arteriosclerotic and syphilitic aneurysms are usually fusiform in shape, and may be found on any of the larger basal vessels; there are as a rule other obvious changes of degenerative type in the other cerebral arteries. On the other hand, 'congenital' aneurysms are unassociated with other macroscopic changes in the arteries. They occur as spherical dilatations, usually at the meeting-point of two vessels, especially in the circle of Willis. From their resemblance to a sprig of mistletoe, they are aptly described as 'berry aneurysms'. Sometimes several such dilatations are encountered at different points in the basal arterial system. They may be as large as a hazel-nut, though usually they are the size of a red currant; at times they are so small as to escape superficial inspection and come to view only after a minute scrutiny of the circle of Willis.

'CONGENITAL' ANEURYSMS.

CLINICAL FEATURES.—The clinical features of these aneurysms are of the greatest importance. One may conveniently refer to them under two headings: (1) Symptoms due to rupture of the aneurysms, and (2) Pre-rupture symptoms. The former constitute the well-known syndrome of spontaneous subarachnoid hæmorrhage.

1. *Spontaneous Subarachnoid Hæmorrhage.*—Although this clinical catastrophe must have been witnessed and described on very many occasions, we owe the modern interest and appreciation to C. P. Symonds for having evaluated and described the clinical events. As a rule the story is characteristic: the victim, usually a young adult, whose previous history may have been quite unremarkable, complains of a sudden and severe pain located in the back of the head and neck. There is often a history of overwork or fatigue preceding the onset, but this is not essential. Precipitating factors may be absent, but quite often we obtain an account of some undue physical exertion (lifting, straining), exposure to strong sunlight (the 'sunstroke' of this country is usually subarachnoid bleeding, as W. J. Adie teaches), or some vasomotor shock, as may follow an ice-cold bath or the play of a cold shower on the head. The occipital headache increases in severity so that the patient often supports the head with his hands, groans, and cries out. Soon nausea and syncope follow, and vomiting usually occurs. Gradually consciousness becomes impaired, though it is not necessarily altogether lost. The patient by now has been assisted to bed, where he lies groaning and restlessly twisting about. He soon becomes irritable and petulant, and usually refuses assistance. Questions are not answered as a rule, but the patient may from time to time cry out and complain of his head or of the light hurting his eyes. Sometimes a period of delirious excitement occurs, almost amounting to a state of mania. At other times consciousness may be completely lost and epileptiform attacks supervene. The doctor on his arrival finds usually a characteristic state of affairs; on a tumbled and untidy bed the patient is curled up and groaning,

from time to time retching or vomiting and tossing from side to side. Often he carries his hand to the back of the head. The blinds have been drawn on account of the photophobia. Little or no attention is given by the patient to the doctor's questions or examination. A rapid investigation usually evinces the following points: the pupils may be widely dilated or on the other hand contracted and inactive; frequently they are grossly unequal in size. The lids are screwed up tightly and the patient resents the light. Rigidity of the back of the neck is common, but a more constant and valuable sign consists in tenderness of the nape of the neck on deep digital pressure (Kehrer's sign). The limbs are only rarely paralysed and are usually hypotonic. Typically the tendon reflexes of the arms and legs are absent and the abdominal responses are often unobtainable. There is no constancy as to the state of the plantar responses; they may be flexor in type on both sides or there may be a Babinski response on one side or on both. At times, too, no plantar response whatever can be elicited. A Kernig's sign is generally demonstrable. The clinical picture therefore is one of meningeal irritation of acute onset. A lumbar puncture clinches the diagnosis by yielding a uniformly and often heavily blood-stained cerebrospinal fluid. If the corpuscles are allowed to settle, the supernatant fluid is seen to be yellow. Examination of the fundus may show nothing abnormal, but in the later stages one may find some degree of papilloedema. More characteristic is the presence of retinal hæmorrhages, which, if large enough, may burst the internal limiting membrane and form a film over the back of the hyaloid body, causing blindness.

The foregoing sketches the clinical picture most often encountered. At times other features may also be present; thus there may be hemiparesis, which may be accompanied by aphasia; in place of the hypotonus and areflexia there may be a condition of spastic quadriplegia with tonic neck reflexes and Babinski responses. Not infrequently the urine is found to be heavily charged with albumin. Very exceptionally the spinal fluid has been found free from blood, although the diagnosis of ruptured cerebral aneurysm has later been pathologically established; in such rare cases the leak has occurred into the subdural—and not the subarachnoid—space.

There is much variability in the course of the symptoms. In favourable cases the headache and irritability gradually abate, the patient may pass into a sleep from which he later awakens with an almost clear consciousness. During such time a second leakage may occur with more serious outcome. In unfavourable cases, unconsciousness deepens, high fever occurs, and the patient succumbs. Death is due as a rule to sudden respiratory failure and not to cardiac incompetence.

2. *Pre-rupture Symptoms.*—Is it possible to diagnose a 'congenital' cerebral aneurysm in the absence of subarachnoid bleeding? In a great many cases—probably the majority—it is not, as no symptoms and no physical signs may be present. There are two investigations, however, which may very occasionally indicate the presence of an unsuspected aneurysm. Thus an X-ray of the skull may reveal an annular shadow near the base of the brain; and, secondly, auscultation of the skull with a stethoscope has been known to reveal a bruit. These two findings must, however, be regarded as very exceptional.

Although cerebral aneurysm usually produce no disability until they rupture, in a few cases suggestive symptoms are present. These are of three main types:—

a. *Recurring headaches:* Retrospective analysis of patients recovered from subarachnoid bleeding (presumably due to aneurysm) reveals in a number of instances a history of 'migraine'. Sometimes the patient will tell us that

the character of the 'migrainous' headache and that of the subarachnoid hæmorrhage are identical in character, differing only in intensity. Whether there is any essential association between the common idiopathic migraine and aneurysmal dilatations of the cerebral arteries is an important question which immediately presents itself. How is one to differentiate clinically common migrainous attacks from the periodic pre-rupture headaches of an aneurysm? In the latter visual phenomena (zig-zags, fortification figures) are perhaps less common. W. J. Adie has stressed the site of the headache as a differential point: a unilateral headache which is sometimes right-sided and sometimes left-sided is more likely to be migrainous; a unilateral headache which appears always on the same side is suggestive of aneurysm.

b. Focal pressure signs: These are due to the implication of various cranial nerves or other important structures by the aneurysm. Thus paralysis of neighbouring sets of cranial nerves may be found; or with the carotid group of aneurysms, pressure on the pituitary stalk or body may produce puzzling physical signs. The syndrome of 'migraine ophthalmoplégique' perhaps belongs to this category.

c. Tumour-like signs: Occasionally the aneurysm, by reason of unusual bulk or rapid growth, may produce a rise in intracranial pressure and focal neurological signs. The diagnosis of cerebral tumour is suggested by such cases, and can only be confuted by the X-ray demonstration of annular shadows or by a cranial bruit. Cases of this type are uncommon.

TREATMENT OF RUPTURED ANEURYSM.—This is an extremely difficult matter for dogmatic ruling. On the one hand, there is a danger of fatal intracranial hypertension, which can always be relieved, however, by repeated **Lumbar Puncture**, by **Decompression**, and momentarily by injection of **Hypertonic Saline**. By so reducing the pressure, however, one is withdrawing as it were a splint from the cerebral arteries, and there is a very real danger of exciting fresh bleeding. The safest and most reasonable procedure would perhaps be somewhat as follows: Withdraw slowly a few cubic centimetres only of fluid for diagnostic purposes. Do not repeat lumbar puncture unless there arise signs of severe intracranial pressure—namely, marked slowing of the pulse-rate, together with increasing blood-pressure and deepening unconsciousness. Otherwise the patient is to be kept at strict rest in a darkened room. Strong sedatives may be required to control the motor agitation, but morphia and heroin are dangerous in this condition. Full doses of **Bromides** or **Barbiturates** are preferable.

PATHOGENESIS.—The nature and causation of these 'congenital' aneurysms has been a source of keen interest. Certainly syphilis and arterial degeneration seem to play no rôle. J. Collier had inclined to the view that they are of infective origin, being caused by a symptomless blood infection. Direct evidence has been lacking, however, and this idea does not explain the characteristic location of the aneurysms. The modern view regards aneurysms as the result of a giving-way of the vessel wall at a point of inherent weakness. It has been abundantly demonstrated that at the angle of bifurcation or junction of two vessels on the circle of Willis, the inner muscular coat is frequently absent. This point of medial defect corresponds exactly with the common site of origin of cerebral aneurysms. Although highly suggestive, the work perhaps raises more questions than it answers, and a great deal of patient research is necessary before the problem can be regarded as solved. We require to know for instance: (1) Whether this medial defect is ever found at points where no aneurysm is present? (This question seems at present answerable in the affirmative, in fatal cases of ruptured cerebral aneurysm.) (2) Whether medial defect is ever found in normal subjects, and, if so, how often? (3)

What process transforms a medial defect into an aneurysmal dilatation? Here it is possible that increased pressure within the cerebral arterial circuit may be the factor: or again the conception of an infective process may be brought in, although histological support is lacking.

ANKYLOSTOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

INCIDENCE.—Hookworm disease in the Middle Euphrates is reported on by E. H. Hudson and Agnes L. Young,¹ who found 109 infections among 5400 out-patients, mostly from farming villages and of a mild nature. An examination of 306 labouring Arabs showed 38 per cent to be harbouring hookworms. Slight infections are therefore common although not previously reported from this region.

CLINICAL.—In Java C. O. de Langen and J. W. Eerkens,² in a study of cedemas, found 20 cases of definite nephrosis, 17 of which were complicated with ankylostomiasis, so they consider that there is a connection between the two diseases. H. O. Gunewardene³ reports on the cardiac complications of ankylostomiasis, in cases of which he often found presystolic murmurs, but without any thrill, and resembling subacute infective endocarditis with some fever present. This complication has only been seen by him in poor patients, and he advises **Rest** until long after the patient has been rid of his worms, together with **Iron** and **Arsenic**. P. A. Maplestone⁴ records a number of experiments in which a known number of ancylostome larvæ from pure cultures were applied to the skin of both Europeans and natives of India to enable the lesions of 'water itch' and 'creeping eruption' to be studied, with the result that in a number the lesions of creeping eruption were produced by both human hookworms, of less extensive degree than those reported from America, but of a similar nature.

TREATMENT.—P. A. Maplestone,⁵ in a paper on testing anthelmintics, compares the efficiency of the Lane and the Stoll methods of finding ova in stools. In the case of hookworm ova 74.2 per cent were positive by both methods, 25.4 per cent were positive by Lane's and negative by Stoll's, and 0.4 per cent were positive by Stoll's and negative by Lane's technique. *Ascaris*, *Trichuris*, and *Trichostrongylus* gave very similar results.

The anthelmintic properties of **Hexylresorcinol** have been tested in Calcutta by P. A. Maplestone and A. K. Mukherji,⁶ who conclude that on account of the very high cost of the drug, and a cure rate of only 7.7 per cent of 26 cases, they cannot consider it an efficient substitute for older anthelmintics, although it appears to be a safe one. A. G. Biggam and P. Ghaliongui⁷ report on the use of this drug in Egypt and also found it to be unsatisfactory, with only 26 cures in 50 cases with repeated 2-grm. doses.

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ANO-RECTAL TUBERCULOSIS. (See also ANUS, FISTULA OF.)

J. P. Lockhart-Mummery, F.R.C.S.

Several papers have appeared on this subject during the year. W. A. Fansler and S. K. Petter¹ analyse 700 cases of tuberculosis treated in the Glen Lake Sanatorium. They classify the lesions under the following headings: perineal cutaneous tubercle; tuberculous ulceration of the mucous membrane; miliary tubercle; lupus; perirectal abscess and fistula; generalized tuberculous ulceration. They find that by far the best results are obtained by destruction of all the diseased tissues by the **Endotherm Knife** and coagulation of all parts

of the wound, and that by this method of operating the chances of reinfection are very greatly reduced. There is less scarring and less post-operative pain. The patients are treated afterwards by **Hot Sitz Baths** once or twice daily and frequent dressings. One of the great points of the treatment is that the patients are dealt with in the Sanatorium itself, where they are under the best conditions for general treatment.

J. F. Montague² points out that primary tuberculosis of the ano-rectal region is rare and that most cases are due to secondary infection from tubercle of the lung, less often of the gastro-intestinal tract.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1933, July, 115; ²*Med. Jour. and Record*, 1932, July 6, 15.

ANOREXIA NERVOSA.

H. Devine, M.D., F.R.C.P.

F. E. Clow¹ observes with considerable justification that the most striking disturbance of the appetite and digestion is anorexia nervosa, a condition described sixty years ago by Sir William Gull. The writer gives the classical description of Déjerine which admirably depicts the clinical picture which these patients present: "It sometimes happens that a physician has patients—they are more apt to be women—whose appearance is truly shocking. Their cheeks are hollow, and their cheek bones seem to protrude through the skin. Their withered breasts hang from the walls of the chest. Every rib stands out. Their shoulder blades appear to be loosened from their frame. Every vertebra shows through the skin. The abdominal wall sinks in below the floating ribs and forms a hollow like a basin. Their thighs and the calves of their legs are reduced to a skeleton. One would say it was the picture of an immured nun, such as the old masters have portrayed. Sometimes they seem to be sustained by some unknown miracle of energy; their voices are strong and their steps firm. On the other hand, they often seem to be at the point of death, and ready to draw their last breath."

In general the patients are women, though not always, and they are usually in an environment which tends to increase their interest in themselves and the value they place on their importance to society. The patient is not going to take any chances with this his glorious position in the limelight—"he has a reputation to live up to". While some observers affirm that anorexia nervosa always follows some emotional strain, there is evidence that the neurotic, hysterical, neuropathic patient can by a mere whim develop into a state where, as Dubois says, "all feminine coquetry has disappeared, and they admit, without being in any degree impressed by it, their paleness and the fact that they have wasted away to a skeleton". J. M. Berkman² in the largest series yet reported (117 cases) concludes that anorexia nervosa is not a common disease; that the low basal metabolism is due to the inanition; that re-establishment of normal food intake in this physiological disorder which is second to a psychic disturbance should be the goal; and that **Thyroid Gland** substitution in small doses continued for a long period is a valuable measure.

The disease is serious in that it lowers the patient's resistance; and mental anorexia can cause death. Some patients have been known to lose half their usual weight, when, Déjerine says, no treatment will save them. The patient who is cured rapidly recovers, but relapses occur in those cases that are badly treated, and in these instances loss of weight is more rapid than in the first attack.

The diagnosis can only be made after the exclusion of organic disease. The difficulty appears to be to recognize the patient who has a true mental anorexia in the process of development. Many of these cases go unrecognized

and untreated for years. All authorities are apparently in agreement that **Change of Environment, Psychotherapy, and Forced Feeding** are the essentials of management. From personal experience Clow sincerely endorses the postulates of Leede—that so long as the patient holds the centre of the stage in a family too easily given to sentiment, instead of reason, very little can be accomplished in rescuing the victim from his pitiable plight.

In a discussion on Clow's paper, H. T. French observes that some interesting work has been carried out recently in connection with animals in regard to appetite. This has shown that dogs fed on a diet free from vitamin B develop marked loss of appetite, absolutely refuse to eat, and apparently go through a condition similar to that which is called anorexia nervosa; but if these dogs are given a fair amount of vitamin B, the appetite is certain to return, and if large amounts are given, the loss of appetite is corrected and return to normal condition follows. Anorexia develops frequently with psychic shock, and because of the mental state no food is taken for a time, lowering the level of vitamin B in the body, thereby developing a vicious circle. French wonders whether if high vitamin B feedings were attempted in some of these cases they might not produce a good result. The basal metabolism in some of these cases runs low, and some degree of improvement follows the use of **Thyroid Extract**. In view of the remarkable results which have been obtained by the use of **Insulin** in very emaciated patients suffering from tuberculosis, French suggests that its trial in these cases of anorexia nervosa might be worth while.

REFERENCES.—¹*New Engl. Jour. Med.* 1932, Oct. 6, 613; ²*Amer. Jour. Med. Sci.* 1930, clxxx, 411.

ANUS, EPITHELIOMA OF.

J. P. Lockhart-Mummery, F.R.C.S.

Squamous-celled cancers of the anal margin form about 4 per cent of all cancers of the rectum and are thus comparatively rare, but they are highly malignant and at one time they were considered practically hopeless from the point of view of successful treatment. The fact that the tumour is on the surface where it is easily noticed usually results in correct diagnosis at an early stage of the disease, and one would therefore expect that the results of operative treatment would be favourable. Unfortunately the nature of the lesion is often not realized until the tumour has reached a considerable size, though its appearance and the dense thickening of the affected tissues should make a correct diagnosis easy. As with squamous cancer of the lip, the results of excision are good if this is done before the growth has spread to the inguinal lymphatics, but if the latter are affected the chances of effectual removal of the disease are poor.

J. S. Raiford¹ reports ten cases treated by **Excision, Rays**, or both combined. The results were not very satisfactory, but the tumours were in a late stage at the time of treatment. He believes the best results are to be expected from external radiation, followed by radical excision. He rightly points out that the irradiation of tissues extensively scarred by previous operations is most unsatisfactory.

Complete excision if the lymphatics are involved necessitates the removal of the rectum and the clearing away of all the inguinal glands and the lymphatic areas between the anus and the glands. This is a very formidable procedure, but it has been done successfully and some of the patients have remained free from recurrence in the writer's experience for many years.

Anal epithelioma responds so well to **Radium** that irradiation should be given the preference over excision, if the case is reasonably early. J. P. Lockhart-Mummery² reports five cases of epithelioma of the anal margin treated by

radon seeds (*see Table below*). The tumour entirely disappeared as the result of the treatment in all five cases and there had been only one recurrence up to the time of the report, though a sufficient time had not elapsed to justify any of the results being claimed as cures. The radon seeds were placed under and

CASES OF EPITHELIOMA OF THE ANUS TREATED WITH RADIUM.

CASE	AGE	DATE WHEN RADIUM WAS INSERTED	SUBSEQUENT HISTORY	WHEN ALIVE
Mrs. G. ..	79	May, 1929	Three months later the growth had almost disappeared. Treatment repeated	Untraced since; went to Australia
Mr. R. ..	57	May, 1930 (Advanced case)	A year later the growth had disappeared	Well to date
Mr. Y. ..	75	August, 1931	After four months the growth had completely disappeared. Slight recurrence in October, 1932. Treatment repeated, and again April, 1933	Well to date
Mr. A. ..	59	April, 1932	Growth entirely disappeared in a few weeks. Nine months later nothing to be seen	Well to date
Mrs. S. ..	72	January, 1933	Growth entirely disappeared in one month	Well to date

around the tumour so as to give as even a dose as possible to the tissues. The dose used was 1.5 millicuries per seed with 0.8 screening, and the seeds were inserted at 1-cm. distances as nearly as possible. If the dose is approximately correct, there should be very little secondary reaction. The results are often spectacular; in several cases the tumour had entirely healed over in less than six weeks, leaving normal tissue, and when the patient was examined a few months later there was no evidence that there had ever been any tumour.

The great difficulty in successfully treating cases of cancer with radium is to obtain the correct dose of rays required for a given tumour. There is no means of accurately calculating the dose required at present, and it is dependent upon the judgement of the surgeon, guided by previous experience. Under-dosage will be useless and over-dosage will certainly cause serious trouble. The formula which is known to be approximately correct is the equivalent of 1.5 to 2 mgrm. of radium per cubic centimetre of growth, acting for a week. This is only very approximately correct,

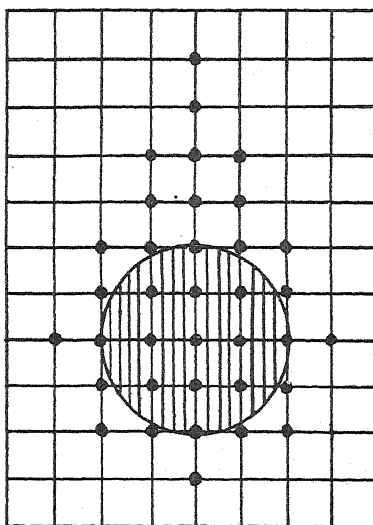


Fig. 5.—Plan for distribution of radon seeds.
See text.

because radon seeds, which are generally used, lose their activity at the rate of about 50 per cent every thirty-six hours, so that the initial dose will be rather too big and the ultimate dose too small. Nevertheless, good results have been obtained with the formula. In order to obtain a rough idea of the dose required the growth is measured across two diameters and an outline of it drawn on squared paper with lines 1 cm. apart. A dot is then made at each intersection of the lines so as to cover the whole area composing the growth and possible lines of spread, as in the diagram (*Fig. 5*). The radon seeds are inserted beneath the growth as nearly as possible at 1-cm. distances from each other.

It is not possible properly to evaluate the results of radium treatment in squamous cancer of the anal margin on a basis of freedom of recurrence over a period of years at present, as there are not sufficient cases available, but it can be stated that the results are at least as good as any that have been reported from extensive excision operations, and we have to take into consideration the fact that radium treatment in these cases does not involve a colostomy and leaves the patient quite normal. Also, though it cannot be said that there are no risks from radium treatment, the risks are at least very much less than with a complete excision of the rectum and lymphatic areas. When the inguinal glands are already involved the prognosis is much less favourable. Radiation followed by excision of the involved lymphatic areas will probably give the best results. Given early diagnosis of the lesion, which should not be difficult, proper irradiation of the tumour and surrounding area with radium affords an excellent chance of curing epithelioma of the anal margin with a very small degree of risk (*Plate II*).

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1933, July, 21; ²*Med. Press and Circ.* 1933, Oct. 18, 368.

ANUS, FISTULA OF.

J. P. Lockhart-Mummery, F.R.C.S.

The question as to what proportion of all cases of fistula are due to tuberculous infection has been widely discussed, and much difference of opinion still appears to exist. A. J. Chisholm¹ has very carefully reviewed the whole subject and has made a careful analysis of 155 cases of fistula in the National Jewish Hospital. Pieces of tissue removed at operation were examined histologically and by bacteriological and culture methods with guinea-pig inoculation. He concluded that tubercle bacilli were only found in those cases where there was evidence of active or arrested pulmonary tuberculosis. His findings conform fairly closely to those worked out in 1920 by W. B. Gabriel at St. Mark's Hospital, that about 20 per cent of all cases of fistula are due to tuberculous infection.

Ernest Miles² gives a complete description of the anatomy, etiology, and treatment of ano-rectal fistulae, and describes all the different variations of this condition and the manner in which they may be treated. He very rightly lays great stress on the importance of not performing the operation in such a manner that it may result in permanent damage to the muscular structure of the anal opening and thereby interfere with full control over the opening; he also attaches great importance to the proper after-treatment of all cases of fistula. Tight packing of the wound is not allowed, and the only object of the dressing is to keep the edges apart and prevent premature closure, which may result in bridging, and to absorb all the discharges. The patient is, when possible, given two baths a day and the wound is cleansed and fresh dressings are applied twice daily. In cases of complicated fistula the operation should be done in a series of stages, if necessary, so as to avoid damage to the muscles or deformity of the anal opening. The author points out that tight packing

PLATE II

EPITHELIOMA OF THE ANUS

(J. P. LOCKHART-MUMFERY)



Fig. A.—Epithelioma of the anal margin before radiation.



Fig. B.—The same case three weeks after treatment with radiation.

of the wound during the healing stages is a common cause of trouble and delayed healing.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1933, March, 610; ²*Proc. Roy. Soc. Med.* 1932, Sept., 1649.

APOPLEXY, CEREBRAL.

Macdonald Critchley, M.D., F.R.C.P.

Within the past two decades our views on the nature and pathogenesis of cerebral hæmorrhage have undergone many vicissitudes. Although the problems are far from being solved, and fresh complexities seem to arise, we are on the whole clearer in our conceptions. It has been customary to distinguish three pathological types of vascular accident as being distinct anatomical and clinical entities. Thus one has been accustomed to distinguish: (1) Cerebral hæmorrhage due to rupture of a miliary aneurysm; (2) Cerebral softening from the thrombosis or occlusion of a diseased blood-vessel; and (3) Infarction due to embolus formation. Actually the problem is much more complex both from the standpoint of the clinician and of the pathologist.

Every text-book on the subject is concerned with the various criteria whereby distinction can be made at the bedside between the apoplexies due to hæmorrhage and to softening. The type of pre-existing vascular disease, the circumstances of the stroke, the depth of unconsciousness, and the course of the affection are points which are traditionally stressed. When, however, one reviews a large series of fatal cases, observed clinically and studied anatomically, one is usually struck by the lack of agreement between the clinical and pathological diagnoses. This holds true even though all the canons of differential diagnosis have been strictly observed at the bedside. Thus a correct diagnosis was made in only 53 per cent of the 269 cases of apoplexy studied by F. Meursing.¹ In the 144 cases of apoplexy examined by E. T. Bell and B. J. Clauson² it was found that the relation of hæmorrhage to softening was the same in hypertensive and non-hypertensive subjects.

Unquestionably the faulty teachings of the physiologists have been responsible for many of our previous misconceptions, but the more recent histological findings have revolutionized our opinions. The important anatomical steps which have led to this *volte face* deserve recapitulation, and we may follow in this respect the useful and detailed study recently made by E. de Vries.³

Histology of the Cerebral Vasculature.—The chief data which have emerged within recent years may be set out as follows:—

1. Cohnheim's conception of the cerebral arteries as end-arteries has been disproved by R. A. Pfeiffer⁴ and by S. Cobb.⁵ The capillary bed of the whole cerebral cortex forms a continuous network. Free anastomosis exists between the capillaries of both the surface and the depth of the brain. Arteriovenous anastomoses probably also exist.

2. That the blood-vessels of the pia are supplied by nerves has been shown by Stoehr⁶ and by G. B. Hassin.⁷ This innervation is derived from the autonomic system (H. S. Forbes and H. G. Wolff⁸), and can be influenced reflexly by vagal stimulation.

3. The intracerebral blood-vessels are also similarly innervated (W. Penfield⁹) and the pial and intracerebral vascular plexuses of nerves are continuous.

4. The cerebral blood-vessels also possess contractile properties independent of the nervous system. G. Hassin showed that the adventitial cells of the cerebral capillaries are practically identical with the so-called connective tissue 'contractile cells' of Rouget.

5. Intermittent spasm of the cerebral blood-vessels is no longer regarded as an impossibility. It is indeed a highly probable factor in the origin of

cerebral symptoms in the transient apoplexies of the hyperpietic, in chronic nicotine poisoning, and in some of the manifestations of severe migraine. Spielmeyer and some others also believe that an epileptic attack is preceded by vascular cramp.

Pathogenesis of the Apoplectic Attack (Figs. 6-14).—The earlier textbooks describe cerebral hæmorrhage as resulting from simple rupture of a miliary aneurysm (Chareot), or of a false aneurysm (Koelliker, Loewenfeld, Pick), or of an arteriosclerotic ulcer. Dissatisfaction with these views gradually developed and was embodied in the hypothesis of Rosenblath. According to this view, regions of the cerebral tissue under certain circumstances become necrosed, possibly through the action of toxins in a chronic nephritis. The walls of the cerebral blood-vessels become involved, and through them blood will leak either by diapedesis or by rupture. Multiple small bleedings will develop rather than a large single hæmorrhage (Fig. 10). K. Westphal and R. Baer¹⁰ modified this hypothesis, believing spasm of a cerebral artery to be the primary factor, followed by necrosis of brain tissue and increased

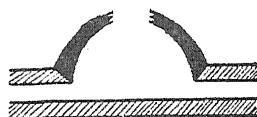
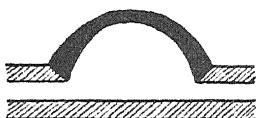


Fig. 6.—Chareot, 1868. Rupture of a miliary aneurysm causes massive brain hæmorrhage.

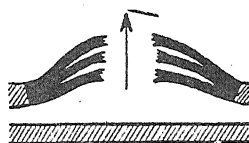
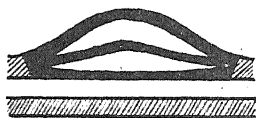


Fig. 7.—Koelliker, 1849, Loewenfeld, 1886, Pick, 1910. Rupture of a spurious aneurysm causes hæmorrhage.

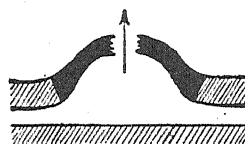


Fig. 8.—Rupture of an arteriosclerotic ulcer causes massive hæmorrhage.

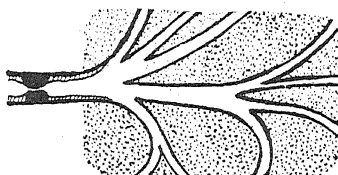


Fig. 9.—Occlusion of the artery, due to arteriosclerosis, thrombosis, syphilitic endarteritis, or embolus, causes infarction of the brain.

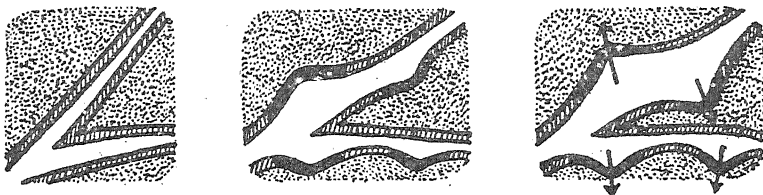


Fig. 10.—*Rosenblath, 1918.* Primary necrosis of the parenchyma causes necrosis of vessel walls and hæmorrhage from many small vessels.



Fig. 11.—*Westphal and Baer, 1926.* Cramp of an artery causes necrosis of parenchyma, after which weakening of vessel wall and rupture of many small vessels follow.

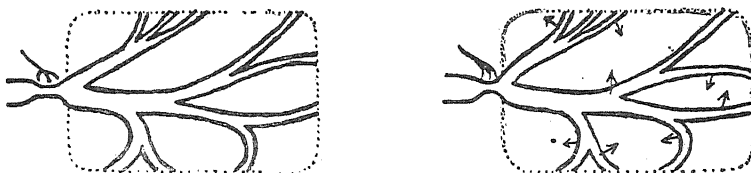


Fig. 12.—*Ricker, 1919.* Cramp of an artery causes stasis of the blood and diapedesis into weakened parenchyma.



Fig. 13.—*Schwartz, 1930.* Cramp of an artery causes weakening of parenchyma and vessel wall with stasis and white or red infarction.

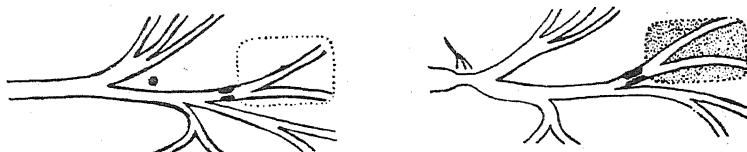


Fig. 14.—Cramp of an artery, or fall in general blood-pressure, causes ischemic softening in an area, depending on a sclerotic vessel.

(Figs. 6-14 reproduced from 'The Chinese Medical Journal'.)

permeability of the vascular coats (*Fig. 11*). The opinion of G. Ricker¹¹ does not implicate any necrosis of the brain tissue as an intermediate stage, the author believing that the stasis within a blood-vessel in a state of cramp is in itself adequate to cause exudation and diapedesis (*Fig. 12*). In other words, almost every cerebral hæmorrhage is actually a red infarction. P. Schwartz¹² modified Ricker's view by postulating a necrosis of the cerebral parenchyma as a stage between vascular spasm and intravascular stasis. While at the present time, lacking sufficient pathological evidence, we hesitate to evaluate the rôle of actual rupture in the mechanism of cerebral hæmorrhage, we must believe with de Vries that rupture certainly occurs at times. The state of the cerebral vasculature is no doubt all-important. De Vries believes that "the more marked the arteriosclerosis, especially of the larger arterioles, the more we may expect large hæmorrhage from one artery. In cases with less arteriosclerosis but with more marked cramp of vessels and changes in blood-pressure, we may expect multiple small lesions affecting a large brain area."

Apoplexy from Acute Fall of Blood-pressure and from Anæmia.—

Analogous to the syncope and fainting accompanying sudden falls in blood-pressure and also severe hæmorrhages, hemiplegia from sudden hypotension may also occur. Without doubt we would diagnose this even more frequently if we knew the regular blood-pressure of the subjects prior to their apoplexy. H. W. Fleming and H. C. Naffziger¹³ had the opportunity of observing patients, whose normal pressure was known, before, during, and after an apoplectic stroke, and by finding a drop in the systolic pressure were able to improve their patients by therapeutic elevation of the pressure. One of their patients—whose usual blood-pressure was 245—showed a pressure of 170 during the stroke. Under treatment, the pressure rose to 235 and the patient recovered. Instances of hemiplegia after anæmia have been reported at various times, and have been especially studied by R. Worms.¹⁴ This author showed the danger to arteriosclerotic individuals of loss of blood, whether from venesection, hæmatemesis, or hæmorrhoids. Symptoms appear from several hours to a couple of days after the loss of blood, but in several instances marked improvement followed prompt transfusion.

TREATMENT OF THE APOPLECTIC PATIENT.—The difficulty of estimating at the bedside of an apoplectic patient the precise morbid processes responsible adds considerably to the difficulties in applying rational treatment. According to de Vries, high blood-pressure in itself does not call for reducing measures, and it is important rather to maintain an equilibrium and avoid abrupt changes. Only when there is reasonable certainty of considerable cerebral edema should hypertonic solutions of **Saline** or **Glucose** be administered intravenously or concentrated **Magnesium Sulphate** be given by the rectum. When one is sure there is a massive hæmorrhage causing increased intracranial pressure and increased blood-pressure, **Cathartics** may be given or a **Venesection** of 200–300 c.c. performed. These measures should not be carried out after the first twenty-four hours. When anæmia or an abrupt fall in the systemic blood-pressure is the immediate cause of the apoplexy, one may carry out stimulating measures, such as general **Massage**, increased **Fluid Intake**, **Caffeine**, **Strychnine**, and **Saline** or **Blood Transfusions**.

Hypertensive Cerebral Attacks.—D. McAlpine¹⁵ has contributed an important paper on the nature and treatment of the cerebral symptoms in *uræmia*. His findings support the opinion of F. Volhard,¹⁶ namely, that the neurological manifestations are not due to nitrogen retention, but rather to disturbances of the cerebral circulation. Under the term 'hypertensive cerebral attack' McAlpine includes those cerebral disorders produced by a sudden

elevation of the blood-pressure, whether or not at a previously high level. According to the presence or absence of cerebral oedema, two types may be described. In the former case the patient is usually under the age of 40, and may be a child suffering from nephritis. In the case of an adult hypertension is commonly present. Sudden severe headache and drowsiness are the characteristic symptoms, often accompanied by vomiting and convulsions. Paralyzes and loss of vision are frequent. Changes in the retina are usual, though papilloedema may be the only obvious abnormality. The blood-pressure is high, and in the case of children the pulse-pressure is small. Manometry reveals a raised cerebrospinal-fluid pressure (250 mm. of water, or more). Albuminuria is constant. Casts and erythrocytes may be present in the urine. Nitrogenous elements in the blood are within normal limits, unless uræmia coexists. In the second type of case—where signs of cerebral oedema are absent—the patient is usually between the ages of 40 and 65, and has been hypertensive for years. Epileptiform convulsions are the prominent symptom; headache and transient paralytic manifestations may have occurred in the past. Severe headache is the immediate precursor of the fit. There is no papilloedema and the cerebrospinal-fluid pressure is not high. The blood-pressure is raised, but falls when consciousness is restored. There may be albuminuria; the blood-urea content is normal unless uræmia coexists. Hemiplegic signs may be present.

The author believes that sudden rise in blood-pressure is the most important factor in the causation of these hypertensive cerebral attacks, though other factors may contribute, such as the occurrence of a previous cerebral thrombosis and changes in the chemical composition of the blood. The convulsions are attributed to spasm of the cerebral arteries. Other angiospastic symptoms of a milder character include transient palsies, aphasia, paræsthesiæ, and visual disorders. The prognosis of hypertensive and cerebral attacks is good provided there is no uræmia. In older subjects the remote outlook depends upon the condition of the heart, while in the young adult the functional integrity of the kidney is all important.

TREATMENT.—According to the author treatment should be directed towards rapid reduction of the blood-pressure. **Venesection** is especially called for in the cases with cerebral oedema. In these **Lumbar Puncture** should also be performed, and the pressure measured, as a guide to future conduct. If the cerebrospinal-fluid pressure is very high, one should beware of forming a fatal 'pressure cone'; if the pressure is moderately raised (200 to 250 mm.), 10 to 20 c.c. of fluid may be withdrawn. Should the headache thereby be increased, no further lumbar puncture should be done. **Hypertonic Salines** may be injected intravenously to relieve headache. Where cerebral oedema is absent, hypertonic salines and lumbar puncture are useless. The author recommends **Venesection**, and **Amyl Nitrite Inhalations**, followed by **Erythrol Tetranitrate** $\frac{1}{2}$ gr. three-hourly until the blood-pressure falls. Later treatment should include vasodilator drugs combined with **Luminal**.

Blood Bilirubin in Apoplexy.—The correct treatment of an acute cerebrovascular accident will depend upon the nature of the pathological process. In the endeavour to assist in correct differential diagnosis of a case of apoplexy, an estimation of the bilirubin content of the blood serum may probably be of some value. In 1928 J. Wilder¹⁷ applied this test, as carried out by dilution ratios, in a series of cases of apoplexy. In one group of cases, comprising 8 cases of cerebral hæmorrhage confirmed at autopsy, all but one showed a clear-cut increase in serum bilirubin. A second group comprised 5 cases, including a meningeal hæmorrhage, an abscess hæmatoma, two brain tumours, and an obscure case. The first four showed a marked increase in blood

bilirubin. Wilder's conclusion was that a blood-bilirubin estimation could distinguish with a very great probability those cases which were of hæmorrhagic nature. The bilirubin increases within the first twenty-four hours and may remain at a high level for as long as four weeks.

G. Cheney¹⁸ investigated the serum bilirubin content in a series of 50 cases of apoplexy; in only 5 was the pathological nature revealed by post-mortem examination. In order to distinguish between hepatogenous and hæmatogenous types of bilirubin increase, Cheney employed the method of the icteric index compared with the Van den Bergh test. In 17 cases there was a definite increase in the icteric index together with a negative direct Van den Bergh reaction. In these 17 cases the clinical diagnoses were: hæmorrhage, 6 cases; thrombosis, 3 cases (including 3 syphilitic cases); trauma, 1 case; and uræmia, 2 cases. There were 10 cases with a normal serum bilirubin content; here the clinical diagnoses were: hæmorrhage, 2 cases; thrombosis, 7 cases; trauma, 1 case. Cheney concluded that, on the basis of his own work and that of Wilder's, a definite increase in the icteric index with a negative direct Van den Bergh reaction following a cerebrovascular accident usually indicates that a hæmorrhage has occurred, and that a normal index after the first day, but within the first four weeks, is strong evidence against a hæmorrhage.

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APOPLEXY, CEREBRAL: SURGERY OF.

Geoffrey Jefferson, M.S., F.R.C.S.

W. Penfield's¹ description of two cases in which he drained encapsulated hæmatomas within the substance of the cerebral hemisphere calls for comment. These are important because both can be claimed as successful interventions, and therefore fulfil the long-existing hope that occasionally at least a cerebral hæmorrhage would be dealt with by surgery. We may be sure that cerebral hæmorrhages would be subjected to operation more frequently could the physician be sure of two things: (1) That his patient is likely to survive for more than a few hours; and (2) Supposing he survives, that he will not be left so much damaged that his escape from death has been dearly purchased. On the first point—probable duration of life—we have no evidence that is capable of use as a generalization. The most that can be said is that it is now admitted that cerebral hæmorrhage is not a cause of sudden death, but this alone does not get us very far. Wilse Robinson² quotes several authorities on this point, but, even if that be granted, it must be admitted that cerebral hæmorrhage is a common cause of rapid death, and it is only the cases surviving for sufficient periods and presenting signs of massive clot which can be surgically considered.

Robinson reports five cases of chronic or encapsulated hæmatomas, which he has found on search to be very rare; three were over 5 cm. in one at least of their diameters, and their survival periods were 8 weeks, 6½ weeks, and 7 weeks. Robinson describes the histological picture of fibroblastic encapsulation around these clots.

The cases operated upon by Penfield were of distinctly unusual type. The first was a boy, 14 years old, who became unconscious within twenty minutes

of a severe vomiting attack. He regained consciousness the next morning, but could not speak and was paralysed down the right side. Five days later when seen by Penfield he was in the same state, and lumbar puncture showed the cerebrospinal fluid to be blood-tinged. The left temporal lobe was immediately exposed and punctured, the cannula coming into contact with a resistant mass, which proved on incision to be a large clot of blood. Retractors were inserted and the clot was removed, the cavity left behind was clean, and was washed out and drained. The boy made an immediate improvement, and eighteen months later was well, apart from slight residual weakness of the right hand. There can be little doubt that this child would have died had he not been operated upon, and herein lies one of the difficulties in assessing the probable outcome of a cerebral hæmorrhage. We know that a certain number of apoplectic subjects survive their 'strokes'; it might be that more would do so if the clot were evacuated. Penfield's second case concerned a woman of 40 with known vascular hypertension who became dizzy with violent headache and vomiting. She did not, apparently, become unconscious, for besides a right-sided hemiparesis she was found to have a right-sided hemianæsthesia and hemianopia. Six days later she had four convulsions and was found to have papilloedema. On the eighteenth day the 'choke' was worse, and a left occipital bone-flap was turned down. The dura was tense, and beneath an area of cortical staining a clot was found in the occipital lobe the shape and size of a lemon. The clot was solid and could be easily removed. The patient made a good recovery apart from the hemianopia, which persisted. Six months later she was well and happy, when she suddenly became unconscious and died two hours later (no necropsy).

These cases have been described in some detail because it is important that the type of cases operated upon should be well understood. They may encourage physicians to consider more seriously than they at present do whether surgery can help a patient believed to have an intracerebral hæmorrhage. The hæmorrhages of senile arteriosclerosis would scarcely be seriously considered as surgical problems, but patients whose age or whose importance to their families' well-being or to the community makes it desirable that nothing should be left undone will suggest themselves as types. But sentiment alone is not an indication for operation. There should be signs not only of a focal lesion but of a clot of such size as to make it worth while to go in after it and evacuate it. In Penfield's first case he was perhaps lucky to find so large and so amenable a clot. In the second case the evidence of size was incontestable.

REFERENCES.—¹*Canad. Med. Assoc. Jour.* 1933, April, 369; ²*Arch. of Neurol. and Psychiat.* 1932, June, 1441.

APPENDICITIS.

A. Rendle Short, M.D., F.R.C.S.

CAUSATION.—A. Krecke,¹ of Munich, passes seven theories in review. Appendicitis has been attributed to infection, to neuro-angiospasm, to mechanical obstruction, to dietetic causes, to foreign bodies, to trauma, and it has been regarded as endemic. He does not pin his faith to any one of these theories. Foreign bodies and trauma are very exceptional causes. It is interesting that Weischer, of Tientsin, had only 2 cases of appendicitis amongst 86,000 patients, and it is very rare in Persia, Arabia, and the Dutch East Indies. It is seldom seen in vegetarians, and was relatively infrequent during the hunger blockade in the Great War.

POSITION OF THE APPENDIX.—C. P. G. Wakeley² challenges the classical description, given by Treves, that the appendix is most commonly directed upwards and to the left, pointing to the spleen. In a series of 10,000 cases collected by Wakeley and his friends, partly at operation, partly in the

post-mortem room, partly in the anatomical department, the positions showed as follows:—

POSITION OF APPENDIX	NO. OF CASES	PERCENTAGE
1. Anterior or pre-ileal	100	1.00
2. 'Splenic' or post-ileal	40	0.40
3. Pelvic or on psoas muscle, near or hanging over brim of the pelvis	3101	31.01
4. Subcæcal beneath the 'caput cæci'	226	2.26
5. Postcæcal and retrocolic	6528	65.28
6. Ectopic	5	0.05

It will be seen from these figures that the retrocæcal and retrocolic positions are by far the commonest met with, amounting to 65.28 per cent, while the splenic position, the so-called normal position, is in reality one of the rarest of all. It is fortunate that the 'splenic' position is so rare, because it is very dangerous and likely to lead to mesenteric thrombosis and portal pyæmia. D. C. Collins,³ of Rochester, Minnesota, on the other hand, in 4680 specimens, found the appendix—

Anterior—		PER CENT
Free in	3262 specimens	69.68
Bound down in pelvis in	370 "	7.9
Adherent to mesentery of ileum in	44 "	0.94
	Total	78.52
Retrocæcal—		
Bound down, partly or totally, retro-peritoneal in	913 specimens	19.5
Free and subcæcal in	58 "	1.25
Bound down to retroperitoneal tissue behind ileum in	33 "	0.7
	Total	21.45

Collins claims that the majority of observers share his conclusions. It is obvious that there is a discrepancy not of fact but of the use of terms, which is unfortunate. Collins found 12 appendices 1 cm. or less in length, and one of 24.5 cm. F. Berthold⁴ describes and figures a cæcum carrying two appendices!

RELATION TO AGE.—H. Arnold,⁵ of Danzig, produces statistics to show that between the ages of 10 and 40 about 70 per cent of the cases are uncomplicated; under 10, and in old age, more than half the cases go on to abscess formation or peritonitis.

MORTALITY.—An interesting table with reference to the national death-rate from appendicitis is given by F. Christofer and W. K. Jennings⁶ (*Table I*).

Table I.—APPENDICITIS DEATH-RATE PER 100,000.
INTERNATIONAL STATISTICS.

COUNTRY	YEAR	RATE
United States ..	1927	15.0
Switzerland ..	1926	11.0
Scotland ..	1926	10.0
England and Wales	1926	7.0
England and Wales	1929	7.1
Germany ..	1926	7.0
Netherlands ..	1926	4.0
France ..	1925	3.0
Italy ..	1925	3.0
Spain ..	1926	3.0
Greece ..	1926	2.0

According to F. M. Findlay,⁷ of Massachusetts, the mortality-rate in U.S.A. is twice what it is in England and has increased over 50 per cent in twenty years, till it now kills 25,000 persons annually and ranks second only to cancer as a killing surgical ailment. This is not due to lack of interest on the part of the profession, for 2500 articles have appeared on the subject in the medical press in the last ten years! American doctors are seriously concerned about the matter, and there is an unusually large output of papers this year, all urging early diagnosis and operation, better education of the public, and no aperients.

The high death-rate in Philadelphia led to a campaign inaugurated in 1930 to stop chemists, doctors, and patients administering purgatives, and to eliminate delay in diagnosis and treatment. The results are published by J. O. Bower.⁸ The death per population was reduced to 282 per 1,953,000 (14.4 per 100,000). This is the lowest in any big American city. The case mortality was reduced from 5.97 in 1928-9 to 4.81 in 1930.

DIAGNOSIS.—Findlay⁷ says that if $\frac{1}{100}$ gr. of atropine is given, either by mouth or subcutaneously, and followed half an hour later by a large enema, and if after the enema is expelled tenderness over the appendix persists, a positive diagnosis should be made. J. V. Luck,⁹ of Los Angeles, finds that much more valuable information as to the diagnosis of appendicitis and acuteness of the infection can be obtained from a differential count of the leucocytes if the Schilling method is used instead of the usual Ehrlich count. In the acuter stages of the disease young polymorphonuclears with the nucleus incompletely divided up ("juveniles and stabs") are much increased in the blood.

TREATMENT.—McNeil Love¹⁰ gives a résumé of the expectant line of treatment for acute appendicitis. There are four types or stages: the early not-perforated case, the subsiding case, those with local peritonitis, those with general peritonitis. All agree that the early not-perforated cases need immediate operation, and that in the subsiding cases operation should be postponed. The third group, usually seen forty-eight hours after onset, is treated differently by different surgical schools. Love postpones operation, because appendectomy at this stage may be difficult and damaging and the patient's resistance is at its lowest. At the London Hospital, surgery in this stage, from the third to the fifth day, used to carry a mortality of 13.7 per cent, and complications were numerous. Expectant treatment means the four F's: Fowler's position, fluids only, fomentations, and a four-hourly chart. The fluids are to be given by the rectum or subcutaneously; as little as possible by mouth. Expectant treatment is not good for children, or the aged, or in the absence of skilled nursing or close surgical supervision. Thus treated, about 65 per cent settle down happily, and the appendix is removed when all is quiet three months later. About 25 per cent form an abscess, which will probably have to be opened, though it may absorb. About 10 per cent get worse and need operation. The mortality in this group is about 6 per cent, so that the average mortality with expectant treatment is under 3 per cent, whereas with immediate operations the death-rate is 5.8 per cent.

A discussion at the Royal Society of Medicine,¹¹ in which Messrs. H. H. Rayner, R. Davies Colley, J. Morley, Herbert Brown, Zachary Cope, Hugh Lett, and several physicians took part, showed that, although the number of deaths in this country from appendicitis has kept fairly steady at 70 to 74 per million persons each year, the case mortality has dropped from about 25 per cent thirty years ago to about 5 per cent. At the Manchester Royal Infirmary the figures were as shown in *Table II*.

The discussion also showed that more and more British surgeons are abandoning the rule of immediate operation in every case. Up to forty-eight hours,

with a definite diagnosis of acute appendicitis with rise of pulse or temperature, everyone advocates immediate operation; also in those cases where severe intermittent colic and vomiting, though with normal pulse and temperature, suggest Professor Wilkie's obstructive type. After the end of the second day the case may be obviously subsiding, in which event it is to be let alone; there may be local peritonitis, which later may develop a palpable lump, or there may be diffuse peritonitis. In cases of local peritonitis, Rayner advised waiting: (1) If the muscular resistance is localized to a small area, and especially if the appendix is probably retrocaecal and previous attacks have recovered well; (2) In the cases with a palpable mass.

Table II.—ACUTE APPENDICITIS. COMPARISON BETWEEN THE RESULTS OF 18 YEARS AGO AND THOSE OF THE PRESENT TIME.*

	THREE YEARS ENDING 1915	THREE YEARS ENDING 1931
Total number of cases	1656	1877
Total number of deaths	209	96
Case mortality per cent	12.5	5
Percentage of early cases in total†	35	66

* Prepared from the Annual Statistical Reports of the Manchester Royal Infirmary.

† By 'early' cases is meant those operated on within twenty-four hours.

On the other hand, if there has been a recent severe exacerbation of pain, if there is exquisite tenderness, or evidence of toxæmia as shown by the facies, the pulse-rate, or temperature, operation is called for. These rules were generally agreed to. In cases with diffuse peritonitis Rayner advised operation, but under a spinal anæsthetic, or gas-oxygen, not ether or chloroform; Zachary Cope preferred to postpone. [We agree heartily with the above. In the presence of diffuse peritonitis, we believe it is safer not to remove the appendix forthwith, but follow the Ochsner-Sherren routine treatment (*see* MEDICAL ANNUAL, 1931, p. 47); but it may be best to slip a strip of rubber dam into the pelvis by a suprapubic incision under a local anæsthetic. It should be removed after two or three days.—A. R. S.]

OPERATIVE TECHNIQUE.—A. M. Shipley and H. A. Bailey,¹² of Baltimore, maintain that obstruction following appendix-peritonitis is usually to be laid to the blame of drainage tubes, which also cause later post-operative adhesions. They allow, of course, that in late septic cases some form of drainage may be life-saving. F. B. Gurd,¹³ of Montreal, lays stress on a transverse incision above the crest of the ilium, 'bipping' the edges of the wound before opening the peritoneal cavity, and packing with gauze soaked in liquid paraffin. He uses 'bipp', without closure of the abdominal wall in the graver cases. He claims to have reduced his mortality to 1.5 per cent. R. A. Cutting,¹⁴ of New Orleans, also favours a transverse incision.

H. J. Wade,¹⁵ from the Department of Anatomy, Manchester, states that the ilio-hypogastric and ilio-inguinal nerves may readily be injured by the McBurney muscle-splitting incision, and that they supply motor fibres to the lowest part of the internal oblique and transversalis muscles, so that injury may involve a tendency to inguinal hernia.

STATISTICS.—R. Atkinson Stoney,¹⁶ of Dublin, publishes a series of 274 cases of appendicitis with a mortality of 2.5 per cent. He does an immediate operation on all cases at any stage. If sepsis is present, he folds omentum so as to shut off the clean from the unclean peritoneum, and smears 'bipp' on the abdominal wall.

H. H. Rayner¹¹ mentions 347 cases with a mortality of 4.9 per cent; his principles of treatment have been described above.

F. B. Boland,¹⁷ of Atlanta, gives hospital figures in which, of 4270 cases operated on, 4.4 per cent died; of 219 dealt with under six hours from the onset, none died. K. Sponheimer,¹⁸ on the other hand, reports a German hospital series of 1112 cases with only 0.7 per cent of fatalities, and P. Bastianelli,¹⁹ of Florence, 1010 cases with a death-rate of 2 per cent. [It is difficult to appraise methods of treatment in appendicitis on statistical grounds until authors define what they mean by 'acute appendicitis'. Those who include afebrile cases, and are in the habit of operating on every patient who has pain and tenderness in the right iliac fossa without any other signs or symptoms, will report a low mortality, about 1 per cent; those who count only febrile cases will average around 5 per cent.—A. R. S.]

J. M. Finney,²⁰ of Baltimore, gives very full tables, too long to summarize, but valuable for reference, of the percentage incidence of all the complications of appendicitis. According to figures given by G. H. Colt and Margaret Morrison,²¹ of Aberdeen, no conclusion can be drawn by statistics for or against drainage of the peritoneal cavity. The total death-rate in 772 cases was 5 per cent; with operation under twelve hours it was 2.26 per cent; twelve to twenty-four, 2.70; twenty-four to thirty-six, 4.08; thirty-six to forty-eight, 6.67; three days, 13.25; four days, 10.26; over four days, 10.14.

Portal Pyæmia in Appendicitis.—Ten cases are described from Moscow, by A. D. Otshkin.²² This complication is met with in about 1 per cent of patients with acute appendicitis, but sometimes there are no symptoms referable to the right iliac fossa. The illness may begin with pain over the liver. The abdomen is very distended without intestinal paralysis, and there are repeated rigors. Jaundice is often seen. The diaphragm may be raised in the skiagram. The mortality was 80 per cent. The best preventive is early appendicectomy, but cases are on record in which ligature of the ileocolic vein has saved the patient.

Chronic Appendicitis.—In a series from Baltimore reported by J. M. Finney²⁰ the mortality of operation for chronic and relapsing appendicitis was under 0.1 per cent in 2106 cases. Both the fatal cases died of paralytic ileus.

REFERENCES.—¹*Munch. med. Woch.* 1933, Feb., 299; ²*Med. Press*, 1932, Aug., 141; ³*Ann. of Surg.* 1932, Dec., 1044; ⁴*Zentralb. f. Chir.* 1932, Dec., 2935; ⁵*Ibid.* 1933, April, 815; ⁶*Amer. Jour. Surg.* 1932, Oct., 16; ⁷*New Eng. Jour. Med.*, 1933, March, 630; ⁸*Jour. Amer. Med. Assoc.* 1932, Nov., 1765; ⁹*Amer. Jour. Surg.* 1933, Feb., 275; ¹⁰*Lancet*, 1933, i, 1229; ¹¹*Proc. Roy. Soc. Med.* 1932, Dec., 181; ¹²*Amer. Jour. Surg.* 1932, July, 52; ¹³*Canada Med. Assoc. Jour.* 1932, Oct., 360; ¹⁴*Amer. Jour. Surg.* 1932, Sept., 369; ¹⁵*Brit. Med. Jour.* 1933, i, 561; ¹⁶*Irish Jour. Med. Sci.* 1932, Nov., 645; ¹⁷*Jour. Amer. Med. Assoc.* 1932, Aug., 443; ¹⁸*Zentralb. f. Chir.*, 1933, Feb., 321; ¹⁹*Polidinicò*, 1933, June, 975; ²⁰*Amer. Jour. Surg.* 1933, June, 772; ²¹*Brit. Jour. Surg.* 1932, Oct., 197; ²²*Arch. f. klin. Chir.* 1932, Sept., 758.

APPENDIX, PAIN IN THE REGION OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The reviewer has been impressed after many years in hospital and private practice with the large number of cases presenting scars in the right iliac fossa who still complain of the same symptoms from which they suffered before the operation. It is customary when symptoms persist after operation for patients to consult another surgeon, and so personal mistakes are not frequently observed.

As an illustration attention has been called to the pitfalls in connection with the diagnosis of *ureteral calculi* (Wheeler¹). The pain associated with stones in the ureter is frequently located in the right lower quadrant of the abdomen without radiation, and in many cases there is no urinary disturbance. About

one case in five, according to the reports of some authorities, had been operated upon for appendicitis. The records of others show that 25 per cent of cases of ureteral stones had undergone the same operation. Although about 2 per cent of cases of stone in the ureter do not throw a shadow with the X rays, and in about 12 per cent pus and blood cells are absent from the urine, it is recommended that straight X rays and microscopic examination of the urine should be made in every case of chronic abdominal pain.

John Fraser² has shown that a *loose sacro-iliac joint* may cause pain referred to the lower quadrant of the abdomen, and that *lesions of the lower nerve-trunks of the lumbar plexus, the sacral plexus, the psoas muscle, the various viscera which occupy the iliac region, and the lymphatic glands* do likewise.

Fraser quotes Sherren in saying that when pain develops *ab initio* in the right iliac fossa the chances are that, whatever the clinical condition may be, the one it is most unlikely to be is appendicitis. In other words, if pain begins and remains in the right iliac fossa, the chances are that the case is not one of appendicitis. If a convenient pair of pathological spectacles is employed, the friends of the patient can be convinced of an existing pathology in the removed appendix.

Spasm of the lower loop of the ileum, the cæcum, and the ileocæcal valve, may be the cause of the pain. Certain types of individuals are liable to unusual degrees of spasm at what may be termed 'junctional points' in the alimentary tract. Ileocæcal spasm is a common visceral explanation of right iliac pain. Fraser also draws attention to the pain in the iliac fossa produced by *affections of the tubes and ovaries. Inflammatory infection of the mesenteric glands* is another common cause.

He mentions an interesting case of *œdema of the psoas muscle* which simulated in all respects acute appendicitis except that there was no muscular rigidity. The psoas muscle had been stretched in a previous manipulation of the hip-joint.

There are, of course, familiar fallacies, such as mistaking right iliac pain for abdominal trouble in a case of commencing *pneumonia*. In the experience of the reviewer, a fallacy of another sort is more common. In acute appendicitis or acute cholecystitis crepitations will often be heard at the base of the right lung, and it may be erroneously inferred that the case is one of commencing pneumonia. The real explanation is that the diaphragm becomes rigid in conjunction with the abdominal muscles, the base of the lung does not expand, and œdema supervenes.

REFERENCES.—¹*Practitioner*, 1933, Nov., 533; ²*Brit. Med. Jour.* 1930, Jan. 18.

ARRHYTHMIAS.

A. G. Gibson, M.D., F.R.C.P.

Auricular Flutter and Fibrillation.—T. M. McMillan and S. Bellet¹ analyse 65 cases of auricular flutter, 12 of which were paroxysmal and 43 established. Of etiological factors the usual antecedent is some inflammatory or degenerative process in the auricular muscle, and amongst the acute cases rheumatic fever, diphtheria, hyperthyroidism, and coronary occlusion are the chief. Flutter has previously been reported by Wedd as being produced by digitalis. In these series 2 such cases were encountered. Both cases had congestive cardiac failure, and generalized arteriosclerosis. Amongst other rhythms noticed 1 case had complete heart-block, 2 cases had ventricular tachycardia, and 2 cases flutter with 1:1 ventricular response. As the result of treatment 66·1 per cent were restored to normal rhythm, or 74·7 per cent of the cases of established flutter. In one case auricular flutter was apparently transformed into auricular fibrillation by digital pressure on the vagus nerve. In the majority of cases **Digitalis** was used until

fibrillation was established; it was then discontinued, and if the normal rhythm had not spontaneously returned within a week, **Quinidine** was administered. Quinidine alone was used if digitalis had failed to bring on fibrillation or had shown toxic effects.

In distinguishing the different types of rapid pulse-rate Wilson's criteria are that in paroxysmal tachycardia the heart-rate is below 200, the auricular and ventricular rates are the same, and the attacks last hours or days. In auricular flutter the ventricular rate is above 200, the auricular rate is often twice the rate of the ventricle, but is sometimes the same, and it lasts from months to years. C. C. Bedell² remarks on the type of auricular flutter with 1:1 response. This type of paroxysm occurs more commonly during the course of established auricular flutter which may have existed for months or years: 5 cases of this type have been observed. The patient with 2:1 flutter when first established may be able to lead a normal life although he may be conscious of palpitation. The attacks of 1:1 flutter that may come on are precipitated by sudden or unusual exertion and may recur at weekly intervals or less. The paroxysm begins abruptly, and the patient may become unconscious, or, if syncope does not occur, there is great weakness and extreme shortness of breath. Precordial pain, tremor, sweating, vertigo, nausea, and mental agitation are also experienced. Most patients are unable to stir during the attack, but one patient with a ventricular rate of 320 was able to walk 'several blocks'. The attack subsides more gradually than it begins. In regard to prognosis, the risk is greater in these attacks than in any other forms of auricular flutter on account of the possibility of syncope and injury. The length of the attacks is usually insufficient to produce serious congestive failure, but when they occur frequently there is an additional burden to the circulation. Full doses of **Digitalis** prevent these 1:1 paroxysms, whereas **Quinidine** appears to make them more frequent. This drug, therefore, should be administered to patients with 2:1 or 3:1 flutter only if they can be kept in bed during its exhibition.

C. Laubry, D. Routier, and A. van Bogaert³ suggest that two clinical signs permit of a diagnosis of auricular flutter—first a small pulse with inequality of the beat, and secondly a third sound in diastole giving a rhythm of three sounds which show continuous variability. The small size of the pulse may be periodic, alternating, or irregular.

T. F. Cotton⁴ writes on the treatment of auricular fibrillation and flutter. The main object in the treatment of paroxysmal fibrillation during the attacks when these are paroxysmal is to make the patient comfortable until normal rhythm is restored. The patient should be reassured and a sedative mixture given. An **Ice-bag or Firm Pressure over the Carotid Sinus** for ten to fifteen seconds may terminate the attack. He recommends **Quinidine Sulphate**, 3 gr., given every four hours. Digitalis should be withheld, as it might establish a chronic state of fibrillation. Auricular fibrillation that has lasted for more than ten days does not revert spontaneously to normal, and is a potent cause of congestive failure, especially in those with mitral stenosis and hypertensive heart disease. The object of treatment at this stage is to relieve the heart of the burden which a rapid ventricular rate imposes on the muscle. A slowing should be obtained by full doses of **Digitalis** such as a drachm of the tincture daily for five to six days followed by half that dose so long as the rate does not fall below 60. In the case of an adult 20 min. daily of the tincture is a minimal maintenance dose, or its equivalent of $\frac{1}{240}$ gr. of Nativelle's digitalin. The dose can be corrected either upwards or downwards by giving the patient the quantity that makes him most comfortable. Quinidine is valuable when there are few signs of structural disease, and it should not be given when there

is much enlargement or a history of hæmoptysis. Absolute rest in bed is essential during treatment and for a fortnight after normal rhythm has been established. The same principles should be adhered to in the treatment of established auricular flutter, and the dosage should be the same. In the majority of cases flutter becomes fibrillation, and at that stage normal rhythm is occasionally restored permanently. Quinidine is not recommended in flutter.

F. Schellong and E. Sicks⁵ refer to the significance of the auricular pulse in established auricular fibrillation. In the early stages of fibrillation the auricle shows a tachycardia. In the course of months or years this auricular rate diminishes and a slow auricular rate becomes more usual in the late stages. This slow form is often the result partly of damage to the whole cardiac musculature, including the conducting system, as the result of the prolonged tachycardia. A slow auricular rate, whether from failure of the centre or interference with conduction, indicates a serious condition of the heart. A fast rate of the auricle therefore implies a better state of the heart and a more favourable prognosis. The authors recommend the use of **Strophanthin** early and in sufficient doses.

Heart-block.—S. P. Schwartz and A. Jezer⁶ remark on the *varying action of Epinephrin (adrenalin) on heart-block*. The syncopal seizures in this malady are not always due to the same factor. In two of the four patients recorded it was due to slowing of the ventricular rate. In two others the attacks were associated with transient periods of ventricular fibrillation. In those patients whose attacks were due to ventricular slowing, epinephrin increased both auricular and ventricular rates. In those patients whose attacks were due to ventricular fibrillation, adrenalin was found to induce these attacks. In one of them auricular fibrillation and tachysystole of the ventricles was produced, and lasted on and off for several hours. In another patient with established ventricular fibrillation an intracardiac injection of 1 mgrm. (1 c.c. of 1-1000 solution) seemed to perpetuate the ventricular fibrillation, for after thirteen hours the patient died. In the first type the drug is frequently life-saving, but is contra-indicated in those with a tendency to ventricular fibrillation.

Janet K. Aitken⁷ states that 37 cases only of *congenital heart-block* have hitherto been reported, for the reason that in order to prove this abnormality an electrocardiogram is necessary soon after birth, for otherwise diseases such as diphtheria, rheumatic fever, or congenital syphilis may interfere with a previously sound heart muscle. Two new cases are described, but although no electrocardiogram was obtained in the early days, the slow pulse had been noticed in early infancy or childhood and no disease had occurred that might have produced heart-block. A useful summary of the 39 cases hitherto reported, including Aitken's, is appended. The most common feature is a slow pulse, in one case as low as 20. The other features are attacks of syncope, and sudden death in two cases. One patient complained of pain round the heart on exertion, and attacks of cyanosis and dyspnoea are a common feature. In three cases, however, no serious cardiac disability was found. The cyanosis and clubbing of the fingers appear to be related to the congenital malformation of the heart which is responsible for the block, and the malformation diagnosed in 25 out of 39 cases was a patent intraventricular septum.

Bundle Branch Block.—A. Graybiel and H. B. Sprague⁸ analyse a series of 395 cases in which the electrocardiogram indicated some form of bundle branch block. They refer to the earlier work dealing with the explanation and meaning of the special characters of the electrocardiogram, and especially to the work of

Barker, MacLeod, Alexander, and Wilson in 1929 who had the opportunity of stimulating various portions of the exposed part of the heart in a patient in whom pericardiostomy had been done. Their technique was similar to that used by Lewis in the earlier experiments, and various points on the surface of the ventricles were stimulated and the electrocardiograms recorded. They found that all of the curves produced when the right ventricle was stimulated had upward initial deflections in Lead I, and all those from the left ventricle had downward initial deflections in the same lead. As the electrodes approached the superior aspect of the heart, the ventricular complexes in Leads II and III tended to become higher, and as they approached the inferior aspect, they became inverted. The only conclusion that could be drawn from these curves is that what has hitherto been taken to be a right bundle branch is really left bundle branch block and vice versa. This explanation clarifies what has hitherto been obscure—namely, that from the electrical point of view the common type is what has hitherto been termed the right bundle branch block, and therefore right ventricular damage, whereas anatomically from the association of its lesion with coronary thrombosis the damage has been mainly to the left bundle. Graybiel and Sprague's cases have been classified into five different types:—

1a. Twenty-six cases of the left bundle branch block with QRS complex and T wave in the same direction in Lead I. This they called the 'homophasic type of left bundle branch block'.

1b. Ninety-nine cases termed 'heterophasic left bundle branch block' with QRS complex and T wave oppositely directed in Lead I.

2. Twenty-nine cases of right bundle branch block in which the initial deflection in Lead I is downward and those in Leads II and III are upward.

3. An intermediate type of bundle branch block, found in 81 cases, in which the QRS is slurred and over 0.1 sec. in duration. The T wave is often, but not always, opposite in direction to the QRS complex, and the QRS is often similarly directed in Leads I and III. These curves are interpreted as being due to partial bundle branch block with conduction sufficiently delayed to increase the QRS complex to over 0.1 sec.

4. One hundred and sixty cases with slight degrees of intraventricular bundle branch block. The QRS complex is slurred and slightly notched, but slightly if at all prolonged.

The three most important etiological factors are coronary arteriosclerosis, hypertension, and rheumatism, and in all of these the cases of left bundle branch block according to this conception are more numerous than those of the right. The authors' conclusion is that bundle branch block almost invariably indicates serious organic disease of the heart and that over half of the patients die in a little over a year.

S. R. Rosenthal⁹ refers to the controversy over the nomenclature of right and left bundle branch block. In one case of proved aneurysm of the sinus of Valsalva involving only the left branch of the bundle of His, the electrocardiogram showed a marked downward deflection of the QRS complex in Lead I with upward deflections in Leads II and III. The author concludes that this case confirms the original work of Eppinger and Rothberger and is against that of Wilson, McLeod, and Barker.

Two non-fatal *stab-wounds of the ventricles* of the heart are reported by W. B. Porter and I. A. Bigger.¹⁰ In the first a wound 1 cm. in length was found on the anterior surface of the left ventricle towards the left border and about 5 cm. from the apex. The pericardium contained 200 c.c. of blood, and the initial incision produced a prompt improvement in the condition of

the pulse and circulation. The wound was stitched up and recovery was uneventful. In the second case only a moderate amount of blood was found in the pericardium and there was a transverse bleeding wound 1.5 cm. in length in the anterior wall of the right ventricle just to the right of the septum and about 5 cm. above the apex level. Recovery was uneventful except for mild local wound infection. Electrocardiograms were made following the operations and they gave the features of coronary occlusion. In the first case with the wound over the left ventricle in which a branch of the left coronary artery had been severed, the features were those of right (Wilson's nomenclature—left) bundle branch block. The electrocardiogram from the second case was an aberrant type.

Two unusual cases of transient complete bundle branch block are described by R. S. Morris and J. McGuire.¹¹ The first case, a female aged 46, collapsed while horse-riding. She expectorated pink frothy sputum, there were bubbling râles in both lungs, and the patient was in a state of shock—pale, cold, and with a moist skin. The right heart was dilated, the sounds were weak, regular, and clear, and the blood-pressure was 90 systolic and 58 diastolic. She was given **Morphine and Adrenalin**; by the next morning she had recovered and the blood-pressure was 120 systolic, 76 diastolic. The electrocardiogram showed right bundle branch block (left according to Wilson's conception). The patient was well in twenty-four hours, and the electrocardiogram four days later showed no trace of bundle branch block. There was no sign of disease which may have precipitated the attack. The second case, a female aged 51, was admitted to hospital with nausea, vomiting, and pain in the right upper quadrant of the abdomen. There was a mass in the abdomen; laparotomy was performed and it was found to be a greatly scarred right lobe of the liver together with a chronically inflamed gall-bladder, which was removed. The heart was not abnormal, the blood-pressure was 158/98, and the pulse regular. The Wassermann reaction was positive. Six weeks after admission the pulse-rate dropped from 140 to 60, and the patient went into a condition of shock, with air-hunger, slight cyanosis, sweating, exhaustion, and a temperature of 95°. The pulse was regular, blood-pressure 70/40, and an electrocardiogram showed the same type of bundle branch block as the former case. The patient recovered from this in three days, and an electrocardiogram taken five weeks after showed the disappearance of the bundle branch block.

L. H. Sigler¹² has shown that bundle branch block may occur without demonstrable lesion, the most common cause apparently being nervous inhibition from the vagus nerve. Sigler reports a case of a male, aged 41, in whom pain appeared spontaneously about every three days, each attack lasting two to three seconds. The pain was sudden, sharp, and knife-like. Between the attacks the patient was comfortable and had no dyspnoea. The electrocardiogram showed QRS complexes of low voltage, and the conduction times were prolonged and markedly slurred and notched. No alteration occurred in the curves after exercise, but after left vagal stimulation the QRS conduction time was lessened to 0.06 sec. with no notching or slurring. The author does not try to give any explanation of this paradoxical fact. He refers to a 16-year-old boy who had no cardiac abnormality except a faint transient systolic murmur, but who showed bundle branch block in the electrocardiogram. This was restored to normal after exercise, which he was able to undertake without distress.

The underlying functional disturbance in the case reported appeared to be fatigue of one of the bundle branches, which fatigue was sufficiently relieved by increased vagal slowing to permit normal conduction. Abnormal QRS

complexes occurred after as long a rest as 0.56 sec., and normal complexes were restored by additional rest of 0.08 sec.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1932, July, 33; ²*Bull. Johns Hopkins Hosp.* 1933, March, 225; ³*Arch. des Mal. du Cœur*, 1932, June (abstr. *Jour. Amer. Med. Assoc.* 1932, Sept. 10, 953); ⁴*Practitioner*, 1933, June, 698; ⁵*Munch. med. Woch.* 1933, March 10, 378; ⁶*Amer. Heart Jour.* 1932, June (abstr. *Jour. Amer. Med. Assoc.* 1932, Sept. 3, 857); ⁷*Lancet*, 1932, ii, 1375; ⁸*Amer. Jour. Med. Sci.* 1933, March, 395; ⁹*Arch. of Internal Med.* 1932, Nov., 730; ¹⁰*Amer. Jour. Med. Sci.* 1932, Dec., 799; ¹¹*Ibid.* Aug., 202; ¹²*Ibid.* 1933, Feb., 211.

ARTHRITIS, CHRONIC. (See RHEUMATIC DISORDERS, CHRONIC.)

ARTIFICIAL RESPIRATION. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

Whatever the form of anaesthesia, the surgeon and anaesthetist will occasionally be confronted by the sudden cessation of respiration during the course of a surgical operation.

In the MEDICAL ANNUAL of 1924 (p. 396) attention was drawn to the fact that when artificial respiration is required on the operating-table it should not be by the Sylvester method or any of its modifications. Such methods are too slow, and with an open abdominal wound are both inconvenient and dangerous. Further, if there is cardiac failure, massage of the heart cannot be employed through an abdominal wound simultaneously with Sylvester's method. The simple direct method is the best. The mouthpiece of an ether inhaler is usually at hand. It is placed on the patient's face, and through it the surgeon blows forcibly in order to inflate the lungs (*Fig. 15*). The closed hand, in the absence of the face-piece, makes an admirable funnel. The surgeon's expired air readily enters and inflates the lungs of the patient, and is expelled automatically with the help of gentle pressure on the chest or abdomen. It is quite dramatic to see how such a simple procedure restores respiration in the moribund patient. The inflation of the lungs with expired air not only stimulates the respiratory centre but also increases the volume of the pulse.

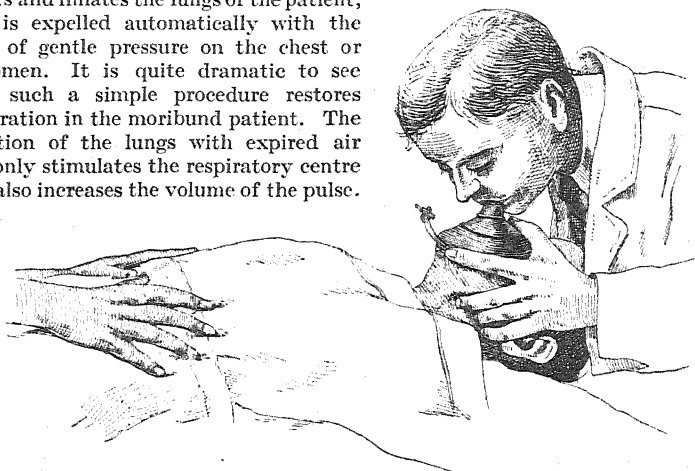


Fig. 15.—Method of inflation of lung by blowing through face-piece of ether inhaler.

W. W. Babcock¹ deals with this subject. He condemns the Sylvester method in a surgical clinic and ridicules the pulmotor and such contrivances. He recommends pressure with both hands over the manubrium sterni of the patient. Pressure of the surgeon's hands should be supplemented by the forearms and elbows, in a back-and-down direction. In this way expiration is produced, and inspiration follows when the pressure is sharply released. The anaesthetist maintains an open air-way by keeping the mandible and tongue forward.

Relays of assistants may be necessary. Such compression methods for the production of artificial respiration sometimes fail. The senile chest with calcified costal cartilages may defy the effort, and it may not be easy to make an impression on the heavy-chested athletic young man. In such cases, Babcock resorts to mouth insufflation, recommended by Woods² in 1926. This method of mouth-to-mouth insufflation was employed exclusively before the year 1756. Babcock makes some interesting observations. He says: "But why not use oxygen or oxygen-carbon-dioxide through the face piece of the anaesthesia machine? Because it is not fool proof. In the desperate emergency there is no time to make sure that the machine is properly delivering only pure oxygen and carbon dioxide in the right proportions. I saw one patient die from time lost as the anaesthetist insisted on proving how effective his apparatus was for purposes of resuscitation. Others may find as Stanley did, when it is too late to help the patient, that a nitrous oxide tank had been placed for that of oxygen. The operators' lungs are not subject to such error. They will deliver only oxygen and carbon dioxide. Usually it is necessary to use a mouth gag and occasionally hold the tongue forward and to the angle of the mouth by a forceps, tenaculum, or thread during the insufflation. An alternative method of preventing the entrance of air into the stomach is to press the larynx back against the oesophagus."

He concludes the paper with the following summary: (1) The conventional methods of artificial respiration are not well adapted to operating room practice. (2) The operator should use no method of artificial respiration that does not cause adequate quantities of air to enter and leave the patient's chest. Artificial respiration is not a gesture, it is an effect. (3) Efforts at artificial respiration should be continued if necessary for many hours, or at least until the heart no longer responds to even the most powerful direct stimulus. The patient should be kept warm. (4) A time tested and effective plan for routine use is here given.

The reviewer can strongly recommend from long personal experience the simple method illustrated in *Fig. 15*. Precautions must, of course, be taken to ensure that neither the tongue nor the backward fall of the jaw obstructs the air-way.

REFERENCES.—¹*Amer. Jour. Surg.* 1932, Aug., 221; ²*Trans. Roy. Acad. Med. Ireland*, 1926, 136.

ASCITES.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The contra-indications to the sudden relief of back-pressure in cases of renal inefficiency with distended bladder are well known. It is also realized that liver shock can be produced by the sudden relief of tension in an over-distended gall-bladder. The same principles are applicable in cases of ascites.

In the old days fluid was withdrawn from the abdomen by tapping with a large trocar and cannula while the patient was kept in a sitting or semi-sitting position. Sir William Ferguson, in his *System of Practical Surgery*, published in 1870, draws attention to the dangers of this procedure. He mentions that as the fluid escapes, the pressure on the vena cava becomes less, and that there is a probability of the patient fainting unless the pressure is maintained by a tight binder.

By modern methods paracentesis can be frequently repeated without anxiety or mishap. But there are cases seen from time to time in which the patient, at first considerably relieved, subsequently falls into a state of progressive cachexia and may succumb. Various explanations are given. Lyonnet and Teyssier in 1902 drew attention to the enormous amount of albumin which was

contained in the fluid removed, and suggested that this fluid should be kept in a refrigerator, and replaced daily by small rectal injections. This seems to be unsound physiologically, for biochemists teach us that absorption could not take place.

Mlle. Grunvald refers to weakness and fainting at the beginning of puncture, which is merely a reflex phenomenon occurring in impressionable people. Collapse at the end of puncture she attributes to cerebral anæmia brought about by the sudden efflux of blood into the abdominal organs on the release of pressure. Syncope may be accentuated after quick withdrawal of fluid in patients suffering from ascites (not necessarily secondary to cirrhosis), by hæmorrhage into the intestines and abdominal wall. These hæmorrhages are found post mortem to be associated sometimes with actual ulceration or punctiform ulcerations of the middle and terminal portions of the small intestine. Not only hæmorrhage but jaundice and grave nervous symptoms occasionally follow paracentesis in cases of cirrhosis.

Sudden death may be explained by the lowering of the diaphragm on the withdrawal of the fluid; increase in the thoracic volume is produced, and, when the myocardium lacks tonicity, acute dilatation of the heart may result. Several other factors, including hypo-hepatism, play a part in the fatal issue. This grave syndrome in the occasional case cannot be foreseen, and the line of safety is once again to provide for very gradual medical or surgical decompression when the pressure is high.

ASTHMA AND HAY FEVER. *J. F. Gaskell, M.A., M.D., F.R.C.P.*

The association of these conditions with increased blood-pressure has been studied by L. J. Witts,¹ who finds that the blood-pressure is normal in most cases, but that, especially in women, hyperpiesia and asthma may coexist. The former does not influence treatment unfavourably. The action of the blood of hay fever patients upon the carbohydrate granules which can be extracted from pollen grains by a special technique, has been studied by D. Harley.² He finds a marked deficiency of lytic action as compared with the blood of normal persons, the deficiency being in the serum.

I. S. Kahn and B. F. Stout³ have studied the cell-count of the nasal discharge in hay fever attacks, and find an eosinophilia which may be of high degree, and which they hold to be diagnostic of the condition. The test, however, fails in cases with very severe attacks, though it can often be demonstrated in the same patient during milder attacks.

The pathology of asthma has been studied in the cadaver by MacDonald.⁴ He lays stress on the presence of a hypoplastic condition of the thymo-lymphatic type, which he constantly found in addition to the well-known local changes in the lung itself. J. B. Christopherson⁵ has studied the pathology of spasmodic asthma in the living subject by means of lipiodol. He was thus enabled to examine the condition of the bronchi and bronchioles in the attack, as well as accurately to define their condition in the quiescent stage, which in the more chronic cases is one of varicosity and beading of the smaller bronchioles, the larger bronchi appearing normal. The emphysematous condition of the alveoli, which is often local and not general, is shown by a late penetration into the alveoli themselves, giving a characteristic picture described as a punctate stippling or mottled cluster-of-grapes appearance.

Acquired occupational asthma is described by H. H. Moll⁶ in workers of sheep wool in the West Riding of Yorkshire. He finds that eight years is the average exposure necessary to produce sensitization. The results of desensitization are encouraging. J. W. Towey, H. C. Sweany, and W. H. Huron⁷ have discovered a series of cases of occupational asthma in workers of maple trees, due

to a fungus spore found below the bark. The patients were skin-sensitive to these spores and cured by removal from their influence.

F. Coke⁸ describes cases of sensitization to wheat in children, taking the form of both eczema and asthma. He holds that irregular periods of feeding with wheat products, with intervals in which the incubation of sensitivity can take place, is the probable pathology of the condition. He has also found cases in adults of the occupational type. The discovery of these cases is dependent on the skin sensitivity test.

The excretion of 'P substance' (proteose) in the urine, described by Oriel and Barker, and allowed to be raised in an attack of asthma, is examined and criticized by R. S. Steep⁹ and F. E. Cormia.¹⁰ Both fail to confirm its specificity, and find no benefit by treatment with the isolated substance. G. H. Oriel¹¹ maintains that 'P substance' is specific in the class of case which shows multiple sensitizations, but not in the class that does not, and finds a close agreement between 'P substance' specificity and the human dandruff test of Storm van Leeuwen. He demonstrates that 'P substance' is not histamine by physiological tests on the guinea-pig uterus.

TREATMENT.—I. Beck,¹² and T. Nelson, B. Z. Rappaport, and W. H. Welker,¹³ have attained good results in hay fever with apparatus producing a **Pollen-free Atmosphere**, and find that the density of the pollination of the outside air is an important factor in determining the period which must be spent in the free atmosphere. But the question of treatment has been chiefly considered from the point of view of the general allergic condition of the host, rather than from that of specific desensitization. Good results are claimed for most varied procedures. H. Beckman¹⁴ claims results with **Nitrohydrochloric Acid** which compare favourably with desensitization. S. M. Feinberg, S. L. Osborne, and M. J. Steinberg¹⁵ advocate a method of **Artificial Fever** produced by the high frequency current; and **Tuberculin** (W. Storm van Leeuwen,¹⁶ J. Maxwell¹⁷), new forms of **Peptone** (A. G. Auld¹⁸), **Lipiodol** (L. W. Fink¹⁹), **Amytal** (M. W. Binger²⁰), **Artificial Pneumothorax** (S. Sametnik²¹), **Viosterol** (B. Z. Rappaport and C. I. Reed²²), and even extract of **Rams' Testicles** (J. O. Hawkins²³) are all claimed to be of value.

REFERENCES.—¹*Guy's Hosp. Rep.* 1933, April, 213; ²*Brit. Med. Jour.* 1933, i, 138; ³*Jour. Amer. Med. Assoc.* 1932, Oct. 29, 1494; ⁴Rev. by W. S. Thayer and J. H. Musser, *Amer. Jour. Med. Sci.* 1932, Dec., 868; ⁵*Lancet*, 1933, i, 11; ⁶*Ibid.* 1940; ⁷*Jour. Amer. Med. Assoc.* 1932, Aug. 6, 453; ⁸*Practitioner*, 1932, Sept., 408; ⁹*Med. Jour. of Australia*, 1932, Dec. 31, 800; ¹⁰*Arch. Dermatol. and Syph.* 1933, May, 745; ¹¹*Proc. Roy. Soc. Med.* 1932, July, 1449; ¹²*Med. Jour. and Record*, 1932, Aug. 3, 90; ¹³*Jour. Amer. Med. Assoc.* 1933, May 6, 1385; ¹⁴*Lancet*, 1933, i, 1227; ¹⁵*Jour. Amer. Med. Assoc.* 1932, Sept. 3, 801; ¹⁶*Proc. Roy. Assoc. Med.* 1933, July, 1454; ¹⁷*Brit. Med. Jour.* 1932, ii, 1182; ¹⁸*Lancet*, 1932, ii, 67; ¹⁹*Brit. Med. Jour.* 1932, ii, 86; ²⁰*Ibid.* 1933, i, 60; ²¹*Munch. med. Woch.* 1933, April 21, 612; ²²*Jour. Amer. Med. Assoc.* 1933, July 8, 105; ²³*Med. Jour. and Record*, 1932, Sept. 7, 186.

AURICULAR FLUTTER AND FIBRILLATION. (See ARRHYTHMIAS.)

BACTERIOPHAGE TREATMENT OF WOUNDS. (See BONES AND JOINTS—TREATMENT OF INFECTIVE CONDITIONS; WOUND TREATMENT BY BACTERIOPHAGE.)

BAD SURGICAL RISKS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

After a long hospital experience a surgeon is able rapidly to identify those cases which are bad surgical risks. Frequently it is difficult to assign reasons why extra precautions and special care are necessary in a given case. There are, of course, the obvious cases in which operation will be recommended with trepidation; but not infrequently the surgeon knows instinctively that a patient with normal heart, lungs, and kidneys may react badly to surgical interference.

B. Rooke¹ defines a bad surgical risk as a type of patient whose prospect of recovery from the active surgical treatment of his condition falls much below the average. He states that during the first 36 hours of life operative interference is borne relatively well, but that after this it is badly tolerated. About the 8th or 9th day, surgery again becomes safer. From the 9th day until the end of the 3rd month operative procedures, if possible, should be delayed. At the age of 25 operations are better borne than at any other period of life. After the early fifties, when the degenerative processes of age are beginning to manifest themselves, operations are well tolerated. During the menstrual period and at the menopause, women bear operation badly; the increased risk is accounted for by the metabolic upsets and disturbances in the circulatory and nervous systems. Women are also bad subjects for gastrectomy. With these exceptions, they are better risks than men. The worst racial risks are the Jews; the Welsh rank next. The higher the social status, the worse the surgical risk. This is probably due to the too favourable conditions under which the upper classes have lived for many generations. Successful business men, butchers, and publicans, all of whom tend to be overfed, are poor risks, and, again, those with artistic temperaments make unfavourable patients. Fear of death or mistrust of their fellows makes most clergymen, doctors, and nurses bad patients. Rooke describes the bad surgical risks due to mental instability, over-indulgence in drugs or tobacco, and those who suffer from septic foci in the mouth, nasal sinuses, and throat. Cases with compensated valvular lesions seldom die on the operating-table, but are prone to develop embolism. Cases of myocardial degeneration also stand the actual operation surprisingly well, but may die unexpectedly about the fourth or fifth day. Arteriosclerosis and high blood-pressure is not a contra-indication to operation, although the strain of vomiting or coughing, if severe, is more than the degenerated vessel wall can stand.

The presence of diabetes is no contra-indication to surgical procedures. It is, of course, necessary to control the condition with insulin, and it is particularly necessary to eliminate all septic foci before the operation is undertaken. Rooke states that cases requiring urgent operation should receive 20 units of **Insulin** and 30 or 40 gm. of **Dextrose** one hour before the operation; from 2 to 4 drachms of **Sodium Bicarbonate** should be given at the same time. In operations that are less urgent about 20 units of insulin balanced by 20 gm. of dextrose should be given every four hours until the urine sugar is reduced to a mere trace. The insulin may now be cut down to 10 units with 20 gm. of dextrose at the same intervals unless the urine sugar has materially increased, when the dose is lowered. Sodium bicarbonate and large quantities of fluid should be given throughout. If more heroic doses of insulin are required, a careful watch for symptoms of hypoglycæmia must be kept. Chloroform is contra-indicated. When operating on a diabetic it is particularly important to avoid rough handling of the tissues, and asepsis must be complete.

It is recommended to treat patients with jaundice and hepatic inefficiency by now well-recognized methods. It is stated in this communication that very little can be done to modify operative risks in gross kidney disease, and that those with a blood-urea of 0.50 per cent are bad risks and those with blood-urea above 0.60 per cent may confidently be expected to develop post-operative uræmia. [Too much stress must not, however, be laid on the result of blood-urea modifications. All elderly people and those who indulge in a diet largely of protein have a high blood-urea which may be considered physiological. Once again in this paper the necessity for intelligent pre- and post-operative management is emphasized.—W. I. de C. W.]

REFERENCE.—¹*Practitioner*, 1933, April, 564.

BENNETT'S FRACTURE OF THE THUMB.*Sir W. I. de C. Wheeler, F.R.C.S.I.*

Too little stress has been laid on the importance of this fracture-dislocation, of which the reviewer¹ has had a personal experience. The injury was described by E. H. Bennett, Dublin, in 1881 (*Fig. 16*). It is often produced

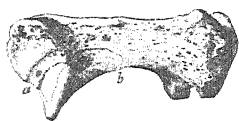


Fig. 16.—Bennett's original case, from the *Dublin Journal of Medical Science*, 1882. *a-b* shows the line of fracture.

(*Figs. 16-18 by kind permission of the 'Medical Press and Circular'.*)

by the point of the thumb striking the ground, or, alternatively, a blow with a clenched fist drives the base of the first metacarpal bone against the trapezium. An oblique fracture of the articular extremity of the metacarpal bone results (*Fig. 17*). Most of the palmar portion is detached. The spliced extremity of the shaft is carried backwards and outwards to form a prominence in the distal extremity of the anatomical 'snuff-box'. In untreated cases this prominence becomes well marked as time advances. Fracture of the proximal metaphysis

in a child is not uncommon. When the shaft slips backwards it can only be retained in position by traction and direct pressure until bony union has taken place. It is well to emphasize that in neglected cases function may be very poor. No work of a delicate nature can be performed. In dressing, the stud and the button cannot be mastered. In feeding, the knife, fork, and spoon become provocative implements. The tumbler cannot be grasped to give the consolation of a drink. With one hand disabled, the other cannot be washed. Without prolonged and careful treatment the end-result may be a disaster. Only those who have experience of the injury can appreciate the helplessness which follows; nor is it generally realized how much the function of one hand depends upon the co-operation of the other. The writer found that immediately, and for some weeks after the accident, any attempt to oppose the thumb to the other fingers was checked by great increase of the pain, combined with the mechanical difficulty brought about by shortening. The 'snuff-box' became obliterated by swelling, and all trace of the tendons forming the boundary disappeared for two months. After six months recovery was complete.

TREATMENT.—Reduction of the deformity is essential, and the reduction must be maintained by extension for about three weeks. The best results



Fig. 17.—The reviewer's thumb after the accident: typical Bennett's fracture.

will be obtained if the thumb is fixed in abduction for a further three weeks after the extension has been released.

In a recent case sufficient anaesthesia and relaxation may be obtained by the injection of 2 per cent novocain solution in the neighbourhood of the fracture, but full general anaesthesia is often required.

Adhesive strapping is applied to the dorsal and palmar aspect of the thumb and held in position by circular strips. To this strapping tapes are applied. Traction is made on the tapes while the surgeon manipulates the fracture. The thumb is then fixed in the abducted position by plaster-of-Paris. A wire gallows is incorporated in the plaster, and to this the extension tapes are tied. The plaster-of-Paris is carefully dimpled and moulded over the injured joint.

The reviewer has designed a simple splint for Bennett's fracture, made by Down Brothers (*Fig. 18*). It is essentially the same as a Jones gutter aluminium splint, padded with white felt and moulded to fit the lower third of the radial side of the forearm. The thumb passes through a large aperture in the distal portion of the splint. To this aperture is attached a copper wire (10 S.W.G.) shaped much like the bars of a miniature Thomas splint. Strapping is applied in the usual manner, and the attached tapes are fastened to the end of the wire; in this way fixed extension is obtained. Before applying the splint, a pad, $\frac{1}{4}$ in. in thickness, of sponge, rubber, or felt, about the size of a penny, is placed in position over the fractured joint. The pad should be secured in position by strapping. The splint is fixed to the forearm by strapping, and then firmly secured by bandages. It is so made that it can be used for either hand. It is left in position for three weeks, and the patient is warned that the extension tapes must always be kept taut.

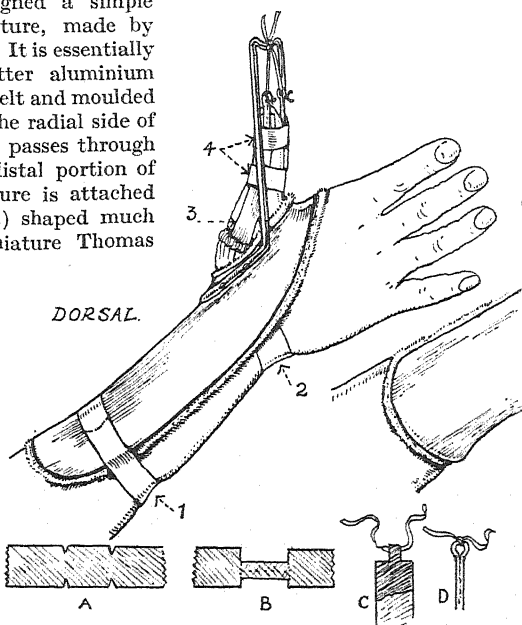


Fig. 18.—Wheeler's traction splint in position. 1, Strapping to fix the splint to the forearm; 2, Strapping under the splint to keep pressure pad in position; 3 A portion of the pressure pad is protruding below through the orifice in the splint; 4, Longitudinal and circular extension straps. A, B, C, D show a simple method of making a terminal loop on adhesive strapping.

In late neglected cases the detached piece of bone which blocks movements may require removal, or the thumb may be manipulated into abduction and kept fixed in that position for several weeks. In all recent cases, after about three weeks' extension and three weeks' further fixation in plaster, occupational therapy is advised. The reviewer immersed his hand several times a day in a basin of very hot water containing artery forceps, scissors, and ligatures. In the hot water the movements of the thumb were less painful. At each sitting, attempts, feeble at first, were made to open and close the pair of forceps, to handle the scissors, and to tie the ligatures. The immersions were followed

by massage, and in the intervals comfort was obtained by the support of a tight bandage of elastoplast. Seven weeks after the injury it was possible to operate upon selected cases. Pain and awkwardness lasted during six months following the accident, but the end-result was all that could be desired.

In some cases of Bennett's fracture there is no tendency to dislocation and deformity.

Summary of Treatment.—(1) In cases without subluxation, apply plaster to fix the thumb in abduction for three to six weeks. Extension need only be maintained during the application of the plaster. Mould the plaster well over the injured joint. In late neglected cases apply the same treatment, using forcible abduction. (2) In recent severe cases with slipping metacarpal shaft, extension for three weeks must be employed. A further three weeks' fixation in abduction is recommended. (3) Extension is made by means of adhesive plaster strips to a projecting wire incorporated in the plaster. (4) Alternatively a splint designed by the writer may be employed. (5) The after-treatment consists in restoring movements and function by 'occupational therapy', followed by massage and radiant heat.

REFERENCE.—*Med. Press and Circ.* 1933, July 26, 90.

BILE-PASSAGES, SURGERY OF. (See GALL-BLADDER.)

BILHARZIASIS. (See SCHISTOSOMIASIS.)

BLACKWATER FEVER. (See MALARIA.)

BLADDER, SURGERY OF. (See also ECTOPIA VESICÆ.)

Hamilton Bailey, F.R.C.S.

Painless Cystoscopy.—No form of local anaesthesia of the male urethra is at the same time safe and regularly satisfactory. The following method of anaesthetizing the perineum, including the anal canal and the urethra, has proved a real boon in the hands of the reviewer. A preliminary small dose of morphia or scopolamine is usually administered. Using a very fine lumbar puncture needle, 0.5 c.c. of **Stovaine** in saline is injected intrathecally between the 4th and 5th lumbar vertebrae. The patient then sits up for one and a half minutes. After this he is placed in the usual lithotomy position. When this small (nearly half the usual) dose of stovaine has been used there is no shock, and cardiac stimulants are unnecessary. Cystoscopy performed with this anaesthetic is ideal for the patient, who feels not the slightest pain. It is ideal, too, for the cystoscopist, who, unharassed by moans and requests to desist, can give his full attention to the appearance of the walls of the tranquil bladder. An additional advantage over general anaesthesia is that excretion of indigo-carmin is not delayed by reason of the anaesthetic.

Enuresis.—Enuresis, particularly nocturnal enuresis, is one of the trials of every-day practice. It is difficult to estimate how many cases respond to the time-honoured treatment by belladonna, talks with the patient, and more drastic measures such as waking the patient up at regular intervals during the night. In males circumcision is often advised for this condition, but without much benefit. It would appear that a Wassermann reaction should be a routine measure. In a series of 180 patients with enuresis, H. Bouquet¹ states the Wassermann reaction was positive 26 times, and syphilis was found in the parents in 51 cases. When the Wassermann is negative, and when the patient does not respond quickly to psychological and medical treatment, a complete urological investigation must be undertaken. M. F. Campbell,² in an investigation of a series of 249 cases of bed-wetting, found in no less than

50 per cent some demonstrable urological lesion. The findings included nearly every known disease of the urinary tract. Amongst the more frequent were all grades of cystitis, valves in the posterior urethra, and atresia meati. When a complete urological investigation fails to reveal a cause the problem deepens. It is well to have the patient X-rayed for the possibility of spina bifida occulta (H. Kamnicker³).

The residual cases Professor G. Marion⁴ classifies as *essential enuresis*, by which he implies that the cause cannot be revealed by any known method of investigation. It is especially interesting to learn of the success Professor Marion has had with these depressing cases, which are a *bête noire* to the practitioner. His experience of the method about to be described extends over twenty-five years. It is simple. He injects **Normal Saline** into the perineum. The needle is inserted at the points shown in *Fig. 19*. In the female the middle line is represented by the vulva. From 50 to 80 c.c. of saline are injected into each side at a depth of 2, 3, or 4 cm., according to the age of the patient. The idea is to get an infiltration of saline around the membranous urethra. Several injections are necessary. Usually two are given each week. A total of six to ten treatments are usually required, but it is useless to proceed unless some improvement is registered after the fifth. Occasional relapses occur, when the injections must be recommenced. The treatment is not painful, and is entirely ambulatory. Details are given of a boy of 9 with spina bifida occulta who was cured by five injections. During the course of injections the time-honoured **Belladonna** is continued. The Professor laconically concludes by stating that he has not the least idea how the injections act.

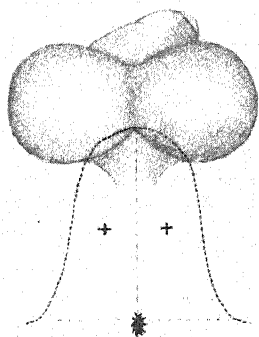


Fig. 19.—Points (++) for the injection of saline into the perineum in the treatment of enuresis. (After Marion.)

Post-operative Retention.—Post-operative retention of urine is a subject of interest to almost all ranks of the medical and nursing professions, and one to which comparatively little scientific attention has been directed. C. G. Jordan⁵ has made a notable contribution to the subject. In the light of carefully compiled data the popular belief that acute post-operative retention is particularly common after rectal and hernia operations appears to be somewhat fictitious. The actual figures of incidence are as shown in the Table.

PERCENTAGE OF CASES OF POST-OPERATIVE RETENTION.

OPERATION		PER CENT
1.	Operations upon the stomach ..	37.5
2.	Hysterectomy	20
3.	Appendicectomy	19.8
4.	Cholecystectomy	15.8
5.	Hernia	15.7
6.	Rectal operations	14.3
7.	Breast	7.5
8.	Goitre	4
9.	Extremities	0

CLINICAL FEATURES.—Acute post-operative retention never occurs before puberty. It is much more common in private than in hospital patients. Retention appears to be more frequent after gas and oxygen anaesthesia than after other inhalation anaesthetics. That it occasionally follows spinal anaesthesia is well-known and most understandable. Proctoclysis definitely favours retention; when the rectal tube has been removed the patient sometimes passes urine naturally.

ETIOLOGY.—Various theories have been put forward to explain this troublesome complication :—

1. That the condition is largely, if not entirely, psychological.

2. That there is an upset of balance between the parasympathetic and the sympathetic innervation of the bladder (*see Fig. 20*), the sympathetic over-acting; this dysfunction perhaps being due to the anaesthetic, post-operative acidosis, morphia, or a rectal tube. Jordan suggests that the high incidence after gastric operations is due to the fact that these patients require exceptionally deep anaesthesia.

3. An incision into the abdominal wall produces a tendency for the abdominal muscles to pass into a state of spasm, thus incapacitating what the Germans call 'Bauchpresser', which, by exerting pressure upon the bladder, is so important in initiating micturition.

TREATMENT.—Jordan, believing that each of the above factors plays a part, bases his treatment in the following logical crescendo :—

1. The rectal tube is removed.

2. Psychological methods are invoked. These consist in talking to the patient, dispelling his fears, and assuring him that if he cannot void urine in a given time a painful catheter may have to be used.

3. The lack of 'Bauchpresser' is the most difficult factor to correct, but it can at least be partially supplanted by firm pressure over the lower abdomen. [The author does not mention **Hot Stupes** to the hypogastrium, which are much used in this country.—H. B.]

4. Potassium acetate, which is both a parasympathetic stimulant and a diuretic, is prescribed—half an ounce of a 1–15 solution of **Liquor Potassii Acetatis** by mouth. This can be repeated every half hour for eight doses, if required. Jordan finds this exceptionally effective.

5. Catheterization.

Naturally, discrimination must be used as to how long to persevere before the catheter is employed. By following this routine the percentage of cases necessitating catheterization was reduced from 90 to 28.

Management of the Paralysed Bladder following Lesions of the Spinal Cord.—R. E. Cumming's is emphatic that catheterization should be avoided absolutely. One must concur with him when he states that infection in these cases always supervenes eventually. He states that automatic emptying of the bladder can often be established, and the repeated use of **Sacral Anaesthesia** sometimes aids automaticity. In cases where the latter fails suprapubic drainage is preferable to catheterization. When the case is not seen before infection has supervened Cumming has found that the prolonged use of indwelling **Ureteric Catheters** is sometimes efficacious.

Treatment of Paresis of the Bladder by Resection of the Presacral Nerve.—Excision of the presacral nerve provides a method of increasing the power of the *partially* paralysed bladder.

The Rationale.—J. R. Learmonth's⁷ writings make it clear how the bladder's power of contractibility improves after presacral neurectomy. The involuntary musculature of the organ is controlled by two antagonistic nervous mechanisms, the parasympathetic and the sympathetic. The *parasympathetic nerves* come

from the second, third, and fourth sacral nerves, and their fibres pass straight through the hypogastric ganglia (*Fig. 20*) to reach the bladder wall. These nerves are the motor nerves of the muscle strands, and inhibit the involuntary sphincter—in other words, they are the *emptying nerves* of the bladder. The *sympathetic nerves* have wide connections which just below the bifurcation of the aorta collect into a nerve-trunk—the presacral nerve. Typically, this nerve-trunk, after running downwards in the middle line in front of the sacral promontory, bifurcates, each limb passing to the vesical musculature. The action of the sympathetic nerves on the bladder musculature is diametrically opposite to that of the parasympathetics—in other words, these nerves are the *filling nerves* of the bladder.

If the parasympathetic nerves—the emptying nerves of the bladder—are acting feebly, the sympathetic—the filling nerves—will overact, and retention results. The rational line of treatment in such a case is to throw out of action the filling nerves, when the feebly-acting emptying nerves will function sufficiently to allow the contents of the bladder to be expelled.

E. S. Foulds⁸ divided the presacral nerve in a male aged 22, suffering from chronic retention, the result of a compression fracture of the 2nd lumbar vertebra. The operation was undertaken seventeen months after the accident and it enabled the patient to regularly empty his bladder.

H. Bailey⁹ describes a case of a woman of 30 who for nearly a year had retention of urine necessitating catheterization. Every known form of treatment failed to produce even the slightest improvement until the presacral nerve was excised. On the very next day the patient passed urine naturally, and has continued to do so.

(See also SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.)

Acute Cystitis.—H. Lett¹⁰ finds that hæmaturia is not uncommon in acute cystitis. In a large series of cases of hæmaturia occurring at the London Hospital cystitis was found to be the cause in 15 per cent of male cases and 40 per cent of female cases. In most instances the amount of blood in the urine was small and tended to appear at the end of micturition. If a patient with cystitis has a high temperature, pyelitis or prostatitis is to be suspected in addition.

Hunner's Ulcer (*Submucous Ulcer of the Bladder, Intramural Cystitis*).—A. I. Folsom¹¹ remarks that Hunner's ulcer is not an ulcer at all. The condition is one of a chronic inflammatory process proceeding in the submucous and muscular coats of the bladder. The wall of the affected portion of the bladder is much thickened, but the mucous membrane is comparatively uninvolved; it is for this reason diagnosis is extremely difficult. The dome of the bladder is more often affected than the floor or the lateral walls. Nothing is known of the etiology; Hunner suggested that focal infection played a rôle. No organism has ever been isolated from the lesion. Women are more often affected than men. Folsom considers the symptoms are definite and characteristic. There is a constant desire to pass urine, accompanied by a stabbing pain. The pain is pronounced when the patient is jolted suddenly. Many patients refuse to ride in a train or bus, and when such a history can be elicited it is important. By cystoscopy the bladder often appears normal

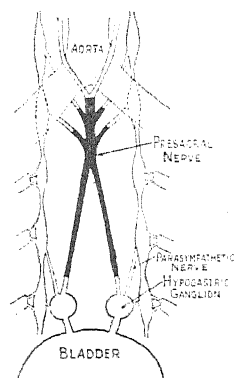


Fig. 20.—Diagram of innervation of the bladder. The portion depicted in black is excised in the operation of presacral neurectomy.

until the dome is examined, when a tiny, stippled red spot no bigger than a split pea is seen. This red spot can sometimes be seen to be bleeding. If the little area is touched with a ureteric catheter, the patient will say, "That is the pain. You have touched the spot exactly."

Folsom has seen 20 cases. The treatment is difficult. **Fulguration** often brings relief, but relapses are common. Of the 20 cases, 12 were treated and 4 cured by fulguration. In 7 **Resection** was carried out, 4 being cured and 2 others improved. In 2 intractable cases **Transplantation of Ureters** by Coffey's method was undertaken with brilliant results in both instances.

Diverticulum of the Bladder.—Diverticula of the bladder are much more common in males; L. P. Wershut¹² says the proportion is 97:3. In 90 per cent of the female cases a urethral caruncle is present. Armed with this knowledge, Wershut suggests that all women with a urethral caruncle should

be examined cystoscopically. Diverticula in most male cases occur after the age of 50 and are associated with prostatic enlargement or stricture of the urethra (A. D. Kutzmann¹³).

C. Lepoutre¹⁴ insists upon the necessity for cystography when a diverticulum is suspected. He uses a 10 per cent solution of collargol, which is inexpensive and un-irritating. Through a catheter the bladder is filled with the solution and the first X-ray is taken with the patient lying down; this is often inconclusive. The patient then urinates, the bladder empties, but the diverticulum remains full (*Fig. 21*). S. T. Brown¹⁵ speaks highly of distending the bladder with air prior to X-ray (pneumocystography). This gives a clear picture of the diverticulum, but there is the small risk of air embolus (*see below*).

A. Spinelli¹⁶ considers that bladder diverticula are due to weakness in the vesical musculature. The bladder possesses three particularly weak spots: (1) Around the intramural portion of the ureter; (2) Immediately above the trigone; and (3) In the region of the urachus. Any lesion which increases intravesical pressure predisposes to herniation of the mucosa through one of these places. Once a diverticulum has formed, the lining membrane becomes inflamed and its epithelial layer is lost.

Purpura of the Bladder.—Hæmaturia is the leading symptom. By cystoscopy a number of submucous hæmorrhages can be seen, varying from a pin's head to one inch in diameter. H. Lett¹⁷ says this condition is due to some infecting focus in another part of the body.

Suprapubic Cystotomy under Local Anæsthesia.—L. T. Mann¹⁸ gives the following instructions. The bladder is irrigated and 2 oz. of 2 per cent novocain left in. The skin and fascia are infiltrated with 1 per cent novocain, and a vertical incision is made through the skin and fascia to the prevesical fat. The bladder is then distended with sterile water and the distended bladder is freed from prevesical fat in the line of the incision. The bladder wall is then infiltrated with novocain, when it can be opened and explored without pain.



Fig. 21.—Cystogram showing diverticulum of the bladder.

The Prevention of Pelvic Cellulitis after Suprapubic Cystotomy.—A grave, and according to some a frequent, event after suprapubic cystotomy is infection of the cave of Retzius, resulting in spreading pelvic cellulitis. In order to obviate this lethal complication in cases where it might be anticipated—e.g., in the heavily infected bladders—certain American surgeons (L. T. Mann¹⁸) practice a two-stage cystotomy. At the first stage a suprapubic incision is made and the cave of Retzius is packed with gauze. At the second stage, four to seven days later, the bladder is opened.

The Danger of Air Distension of the Bladder.—During the course of an operation of suprapubic cystotomy some surgeons use air to distend the bladder. Air distension is also used by some prior to an X-ray (pneumocystogram). There is an element of danger in these procedures. H. S. Jeck¹⁹ records a case of fatal air embolus from air distension of the bladder. The patient had a vascular growth in the fundus of the bladder, and doubtless air entered an open venous channel connected with the growth.

Rupture of the Bladder.—The mortality of rupture of the bladder when operation has been performed within the first twelve hours is approximately 11 per cent; when operation is delayed to twenty-four hours the mortality rises to 55 per cent. It is important to have a reliable confirmatory test for rupture of the bladder. E. G. Mark²⁰ condemns the injection of fluid or air into the bladder for the purposes of confirming the diagnosis. He has found excretion urography of value in this respect. In the case illustrated in his article the X-ray picture shows extremely well an extraperitoneal rupture with urine containing the dye extravasating upwards.

Tumours of the Bladder.—In cases of neoplasms of the bladder there is far too much delay between the onset of symptoms and the commencement of treatment; in 65 per cent symptoms have been present for twelve months or more.

The majority of bladder tumours are either papillomata or carcinomata, and they occur in roughly equal proportion, 151 papillomata to 155 carcinomata (L. R. Fifield, quoted by A. E. Roche²¹).

Carcinoma of the bladder occurs in two principal forms—malignant papilloma and squamous-celled carcinoma. The latter is less common but is more quickly lethal, for it metastasizes about twice as frequently. The transition of a simple papilloma to malignant tumour is too subtle to be recognized irrefutably by histological methods. Roche quotes W. Boyd, who says, "No field for microscopical diagnosis gives less satisfaction to the pathologist. Equally, if not more, reliable information can be gained from a cystoscopic study than from microscopical examination of a small portion of the tumour."

Bladder tumours occur frequently in aniline dye workers, and if aniline dyes are injected subcutaneously into rabbits, some of the animals develop papilloma and other tumours of the bladder. It has been found in dye factories at Ludwigshafen that purification of the air in the work-rooms lessens the incidence of bladder tumours among the workers.

TREATMENT.—**Cystoscopic Fulguration** of all varieties of papillomata is an eminently satisfactory mode of treatment, but the patient must attend for regular cystoscopic examination after an apparent cure. The routine for many years at the Mayo Clinic is to impress upon the patient to attend at the end of three months, again at the end of another three months, then after a further six months, and finally after an interval of a year. (V. S. Counseller and W. Walters.²²)

The treatment of established carcinoma of the bladder is still far from satisfactory. V. Pauchet remarks that cancer of the bladder remains truly the "Calvary of urology" (quoted by F. Cathelin²³). "The army of radium

enthusiasts of a few years ago has dwindled to a corporal's guard" (W. H. Haines²⁴). The hope of the future appears to be in the development of the operation of **Total Cystectomy**; each year this operation is becoming more practicable. R. C. Coffey²⁵ considers that cystectomy for carcinoma of the bladder is probably one of the most successful operations that has been introduced into the domain of surgery for the treatment of carcinoma. M. L. Boyd²⁶ says he cannot understand why it is not advised and undertaken more often; W. H. Haines emphasizes that total cystectomy is meeting with more and more success each year in the hands of expert surgeons.

The principal cause of death in cancer of the bladder is ascending pyelonephritis (G. G. Smith and E. R. Mintz²⁷). Particularly as obstruction to the ureter by the growth predisposes to an ascending nephritis, M. L. Boyd pleads that **Nephrostomy** would help the patient considerably whatever the form of treatment undertaken for the growth. If total cystectomy is carried out the nephrostomy would be permanent (*see* KIDNEY, SURGERY OF—NEPHROSTOMY).

G. G. Smith²⁸ calls attention to tumours of the bladder following the application of radium to the cervix uteri. The patient complains of frequency and hæmaturia. The symptoms and sometimes the cystoscopic appearance of these cases suggest carcinoma, and it is well to know that a heavy dose of radium to the uterus occasionally produces these untoward bladder symptoms.

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BLOOD DISEASES IN INFANCY AND CHILDHOOD. (*See* ANÆMIA IN CHILDHOOD.)

BLOOD TRANSFUSION.

Sir W. I. de C. Wheeler, F.R.C.S.I.

H. Dodd¹ comments on the simplicity of blood transfusion. The operation resolves itself into three stages: (1) Testing the bloods; (2) Collecting and citrating the blood; (3) Injecting the citrated blood.

Collection of Blood.—Examine both arms of the donor and select a large vein. If the veins are obscure, hang the arm in a dependent position for five minutes in hot water. In addition put the blood-pressure apparatus bag round the arm and pump it up to 50 mm. Hg, when there is usually no difficulty in selecting a suitable vein. Before use rinse everything with a sterile citrate solution. Prepare the donor's arm from the shoulder to the finger-tips (the limb can then be handled by the surgeon's sterile hands, pulse felt, etc.). Inject a drop or two of novocain intradermically over the selected vein. A large needle can thus be painlessly inserted. Fit a large Record needle to the syringe, fill and empty it several times with citrate solution, and finally half fill it. With the blood-pressure apparatus in position and the donor's arm on an arm-rest, the vein is punctured by transfixing both its walls with the needle, the opening facing upwards (*Fig. 22, 1*), then rotate the needle until the opening faces in the opposite direction (*Fig. 22, 2*). When blood enters the syringe the assistant places the glass jar (containing the stirrer and 2 oz. of 4 per cent citrate

solution) beneath the needle; the syringe is gently detached, and the blood flows briskly into the jar. The blood is slowly stirred by the assistant or the operator. The donor takes a bandage in the hand of the arm being used and squeezes it slowly but firmly ten to twenty times a minute; this helps the

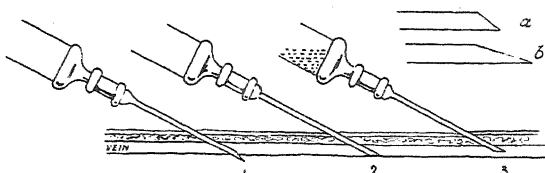


Fig. 22.—Illustrating method of inserting needle and collecting blood. 1, Point first transfixes vein (opening facing upwards); 2, Needle rotated 180° (opening now facing downwards); 3, Needle withdrawn, whilst sucking with syringe. *a*, A short bevelled needle (advised); *b*, A long bevelled needle. (Figs. 22, 23 by kind permission of the 'Practitioner'.)

expulsion of the blood. The pressure apparatus is released and the puncture wound dressed. When the needle is removed there may be a brisk flow of blood, and this may be caught in the vessel. It has only touched sterilized skin and this is no bar to its use. The flask containing the blood is put in an enamelled jug containing water at 110° F., covered with sterile gauze (Fig. 23). A jug is better than a bowl; a jar may topple over in the latter.

Injection of the Citrated Blood.—The injection should take forty to sixty minutes. This slow introduction is vital to the complete success of the transfusion. In difficult cases a vein is found in much the same way as in the case of the donor, but it may have to be exposed by incision. Even in collapsed patients if the limb is hung down and the blood-pressure bag is applied to the arm at 50 mm. Hg, the median basilic and median cephalic veins will fill sufficiently for puncture by a sharp fine serum needle. When the needle is in position and some blood is drawn into a syringe holding citrate solution, inject a little of the blood and citrate from the syringe into the vein. Failure to enter the vein calls for exposure by cutting. The skin should be incised over the median basilic vein, which is tied at its lower end. Another ligature with the first knot loosely tied is passed round the upper end of the vein (this is in readiness to retain the cannula).

The vein is opened by pinching it up with the forceps and making a snick with the scissors. The cannula which is securely attached to funnel and tube containing saline can be slipped well into the vein and tied. Allow the saline to flow and slowly introduce the blood, the first 2 oz. in ten minutes and then 1 oz. every two minutes. [The reviewer believes that the success of all transfusions and of spinal puncture depends in no small measure on the needle being very sharp.—W. I. de C. W.]

Transfusion in Infants.—I. J. Wood and C. W. Ross² describe the giving of blood to infants. The most favourable site for an injection of blood is the

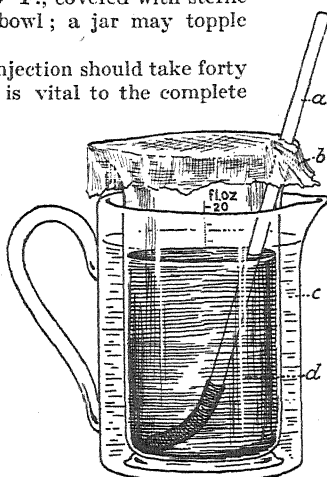


Fig. 23.—The blood collection. *a*, Rubber-tipped stirrer; *b*, Sterile gauze cover; *c*, Water at 110° F. in enamelled jug; *d*, Blood in glass jar.

great saphenous vein opposite the medial malleolus. The leg should be first splinted on a well-packed back splint, the other leg being attached to the table by a clove hitch. The skin after preparation is locally anæsthetized and an incision about $\frac{1}{2}$ in. long made transversely to the long axis of the leg. The

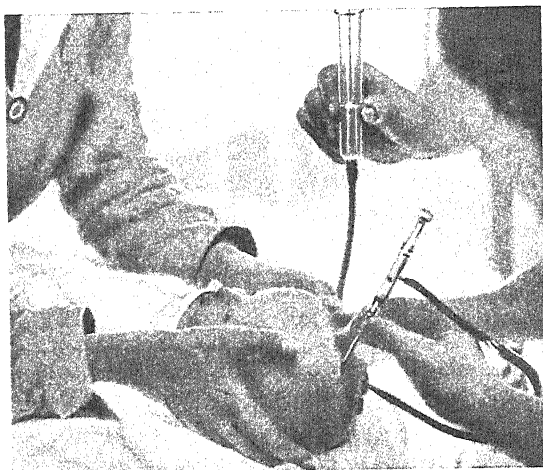


Fig. 24.—Showing the introduction of glucose-saline solution into the superior longitudinal sinus by means of the Kaufman syringe. (From the 'Medical Journal of Australia'.)

central point is slightly anterior to the middle of the malleolus. The vein is seldom visible. The depth of the vein often causes surprise and there are often a few fine veins lying superficially. It is, fortunately, large, and usually there is no obstacle to the insertion of a needle: 10 c.c. per pound body weight

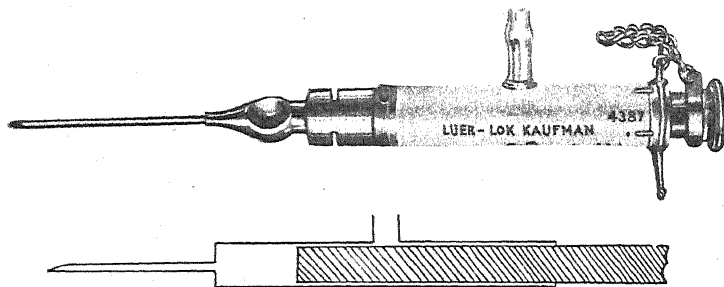


Fig. 25.—The Kaufman syringe, with a diagram to show the mode of working. It serves as exploring syringe, window, and valve, and avoids any risk of moving the needle once it has entered the vessel.

(Figs. 24, 25 reproduced from the 'Australian and New Zealand Journal of Surgery'.)

is the average amount of injection. In babies in whom the anterior fontanelle is as yet open (usually up to about fourteen months), the median longitudinal sinus offers an alternative route for the introduction of glucose and saline solutions (Fig. 24). Wood and Ross fear the introduction of blood by this

route, as an accidental perforation of the deep wall of the sinus has led to death. The child is held supine. A great convenience is the use of the Kaufman syringe (*Fig. 25*). This instrument is similar in size and pattern to the usual hypodermic syringe, but has a side-tube midway along the barrel and a ground-glass plunger with a restraining chain to prevent its being withdrawn too far. A needle is connected to the syringe, a rubber tube and glass funnel to the side tube, and the whole is filled with saline to the exclusion of air. The needle is inclined at about 35° to the scalp, pointing towards the occiput at a point about $\frac{1}{4}$ in. anterior to the posterior limit of the fontanelle. It is inserted with the greatest caution, the median plane being strictly adhered to, to a depth of a few millimetres. A negative pressure is maintained in the syringe barrel by the traction on the plunger. As soon as the free entry of blood is seen, the plunger is drawn back and the infusions commence. A simple preliminary sedative, such as **Chloral Hydrate**, is often indicated. This procedure can be repeated every day if necessary. The writers have seen no fatality in the administration of saline and glucose solutions.

Reactions after Intravenous Infusions.—It has been mentioned elsewhere that the reviewer has eliminated reactions after glucose infusions by the use of chemically pure ingredients such as Merck's dextrose, by dissolving the dextrose in freshly distilled water, and by sterilizing this in a flask in an autoclave for fifteen minutes under 15 lb. pressure. Before sterilizing the solution is filtered twice. Whatever precautions are taken, occasional reactions of a cryptic nature must be expected.

L. Rademaker³ refers to what is a common experience, i.e., the evident lack of organization and method of preparing solutions in hospitals. In distilling the water it was found necessary to observe four rules: (1) To distil slowly; (2) To distil for fifteen minutes into waste—this cleans out accumulated products; (3) To deconcentrate with sufficient rapidity; (4) To clean entire apparatus regularly every six months. Failure to observe any of these rules resulted in reactions. The solution most used has been 5 per cent glucose in normal saline. Rademaker does not attach much importance to the speed of injections or the temperature of the solution.

R. Lewisohn and Nathan Rosenthal⁴ deal with reactions following transfusion of citrated blood. Citrated blood has the same clinical value as unmodified blood in cases of shock and hæmorrhage, but owing to the danger of rigors in very ill patients, non-citrated blood is thought preferable.

Lewisohn and Rosenthal, however, state that chills follow transfusions of non-citrated and of citrated blood in the same proportion of cases, and that the question of prevention of these reactions is of the greatest importance. The writers are convinced that the addition of sodium citrate to the blood is not responsible for the reactions. They are due to the presence of foreign protein. This protein is either extraneous matter present in the distilled water or the remains of blood proteins from a previous intravenous injection. The main step, therefore, is the cleansing of instruments and the preparation of solutions so that they are rendered absolutely free from all foreign protein.

For the removal and elimination of foreign protein from the distilled water, or old blood from the apparatus, the following procedures are carried out:—

1. *Distilled Water, Sodium Citrate, and Sodium Chloride.*—Triple distilled water, obtained from a special Barnstead still, is used for the preparation of sodium citrate (30 per cent) and sodium chloride (0.85 per cent). Sodium citrate (30 per cent) may also be bought on the open market in 5-c.c. ampoules. One should inquire from the manufacturer for sodium citrate prepared with triple distilled water. For actual use, 1 c.c. of this concentrated sodium citrate solution is used for every 100 c.c. of blood.

2. *Special Cleansing of Apparatus.*—After each transfusion, all parts are separated and washed in cold water for the removal of blood. They are then washed in a dilute solution of green soap to which compound solution of cresol has been added to make up about a 1 per cent solution. They are now thoroughly rinsed in tap water. All parts are then placed in a large pan containing sodium hydroxide (0.1 per cent solution) and boiled for five minutes. They are then transferred to a large pan containing distilled water, to remove the sodium hydroxide. The glassware and rubber tubing are again washed with triple distilled water and are ready to be assembled and sterilized, either in metal boxes or in special bundles, in the autoclave. The glassware and rubber tubing are boiled separately. The needles are always sharpened before being treated, but boiled for only three minutes in sodium hydroxide solution (0.1 per cent).

REFERENCES.—¹*Practitioner*, 1933, March, 390; ²*Australia and N. Z. Jour. Surg.* 1933, Jan., 317; ³*Surg. Gynecol. and Obst.* 1933, May, 956; ⁴*Jour. Amer. Med. Assoc.* 1933, Feb. 18, 466.

BLOOD-VESSELS, SURGERY OF. *Sir W. I. de C. Wheeler, F.R.C.S.*

Thrombo-angiitis Obliterans.—The name 'thrombo-angiitis obliterans' was suggested in 1908 by Buerger. As recently as 1927, when the reviewer called attention to the subject¹, the literature was sparse, but more recently the condition has received wide attention. The old supposition that it almost exclusively occurred in male adult Jews who had migrated from Russia was found to be erroneous. For no ascertainable reason some inflammatory condition arises in the deep vessels of the extremities, usually the legs, ending in thrombosis and obliteration. As time goes on—weeks, months, or years—the organization of the inflammatory products proceeds until finally local syncope and death may supervene. When a point is reached at which the circulation is at a minimum and a struggle is taking place to maintain the vitality of the part, the pain often becomes unbearable, and, indeed, amputation may become inevitable. The disease is pre-senile, is non-syphilitic, and is not embolic in origin. The veins and arteries may be equally involved.

The reviewer has seen examples of both the acute and chronic cases. In one case of a robust sailor who contracted the disease at the age of 25, all the preliminary phenomena were confined to the feet; later the gangrenous process was deep and destructive to the lower limbs over a period exceeding ten years. In a second acute case showing all the signs of Buerger's disease conservative treatment such as hot-water baths, diathermy, sympathectomy, immersion of the foot in heated wax, etc., failed to influence the progress of the disease. The limb was amputated, and thrombophlebitis with occlusion and calcification of the deep veins was found in addition to the typical arterial obliteration. Canalization of the thrombi and of the connective tissues completed the pathological picture.

H. R. Mahorner² refers to thrombo-angiitis as one of the most dreadful diseases which may attack man. The cause is unknown. It occurs almost exclusively in the male sex. Much experimental work seems to point to an infectious nature of the disease processes, and probably some day this will be proved. In a typical case the peculiar purplish red colour of the feet on dependency, the cadaveric blanching on elevation, the tardy return of colour when the limb is lowered, the absence of pulses, and the occurrences of migrating phlebitis, are characteristics which leave little room for doubt as regards positive diagnosis. Raynaud's disease occurs much more frequently in women. The disease is bilateral and symmetrical. The pulse is usually felt in periods of remission.

TREATMENT.—In some cases the disease tends to run a self-limited course and the collateral vessels attempt, and sometimes accomplish, a satisfactory circulation. Amputations are, of course, to be delayed as long as possible. The patient must be cautious about keeping the feet clean. Avoid tight shoes and inadvertent trimming of corns and nails. In the absence of open lesions, **Contrast Baths** should be used, twenty minutes twice a day, keeping the extremity immersed one minute alternately in water at 45° F. and 105° F. **Heat** from electric lights is a helpful measure and should be used twice a day for thirty minutes. Though we are not sure of the part tobacco plays in the etiology it may be a factor, and patients should stop smoking. **Typhoid Vaccine** intravenously has given encouraging results in some cases. The method is to start with about 15 million of the triple vaccine and increase as the patient becomes tolerant. The injections are given every three or four days, being gradually increased up to 40 millions. A second course of treatment is given after an interval of six weeks. The mode of treatment is by no means a very simple one nor is it entirely safe. Peri-arterial sympathectomy has not been a success, but **Lumbar Ganglionectomy** sometimes produces good results by release of added spasm of the vessels. There is also a greater flow of blood in the lower healthy collaterals. Too much must not be expected from the operation, as the essential lesion is absolute occlusion of the vessel and not functional spasm. The necessity for **Amputation**, notwithstanding every effort in palliative treatment, frequently arises.

The reviewer believes typhoid vaccine may cause such improvement in thrombo-angiitis obliterans that, if it can be given once a week without too much disturbance and reaction, it is preferred by many patients to operation. If there is distinct improvement from such therapy it may be assumed that improvement also will follow operation.

A minor point in the treatment of these cases is that alcohol internally may be beneficial. There is some evidence that Raynaud's disease and thrombo-angiitis obliterans are in the same pathological group. An initial spasm may be the primary cause of the thrombosis.

In performing abdominal sympathectomy both trunks should be resected. They are exposed by a long incision and the use of a large self-retaining retractor. It is best to divide the right sympathetic trunk first because the operation is more difficult. The posterior peritoneum is divided near the point where the ureter crosses the great vessels. Sometimes it is necessary to mobilize the cæcum and obtain access behind the peritoneum by this means. On the left side it is usually better to mobilize the pelvic colon as a routine. When approaching the sympathetic trunks, care must be taken of the small vertebral veins which cross the nerve trunk. The trunk is divided below the fourth ganglion and above the second. The ganglia are recognized by the anterior and posterior ganglionic fibres. The patient during the operation is in the extreme Trendelenburg position.

(See also ADRENALECTOMY; THROMBO-ANGIITIS OBLITERANS.)

Acute Pyogenic Phlebitis.—H. Neuhof³ states that there can be no doubt of the fact that phlebitis of a surgically accessible and recognizable vein is the feeding focus of surgical septicæmia in many cases. There is terrific mortality under so-called conservative treatment. The general surgeon can often remove without danger the vein bearing the lesion. Proximal ligation of the vein should be considered a temporizing method. The procedure adopted is excision of the vein at the site of phlebitis.

Arterial Embolism.—A. A. Zierold⁴ points out that most arterial emboli have their origin in cardiac thrombosis. It is true that thromboses may appear at other points in the vascular tree, but these are not so easily subject to

dislodgement and therefore furnish a much less frequent source of embolism. The emboli tend to lodge at points of major bifurcation in the arteries. Arterial spasm may cause complete occlusion and probably accounts for the initial pain, and the spasm extending peripherally explains the failure of coincidence in location of pain and the position of the embolus. The end-result is gangrene to a level determined by the collateral circulation.

The surgical treatment is exposure of the vessel at the site of obstruction and the removal of the obstructing embolus and thrombus. The average age of the patients mentioned was 65 years; in all cases sudden severe cramp-like pain was the outstanding feature. The site of the pain was always distal to the arterial obstruction, but was of no value in localizing the position of the embolus. Pain, anaesthesia, pallor, coldness, and subsequent discoloration were not very helpful in identifying the exact point of lodgement. The most valuable finding was the presence or absence of pulsation in the affected vessel. This definitely located the point of obstruction. The majority of emboli lodge in the vessels of the lower extremities, but two cases are mentioned which occurred in the right axillary vessel. The most common site of obstruction was found in the lower portion of the femoral artery where it passes through the adductor muscle to enter the popliteal space. The next most common site is at the branching of the profunda femoris. It is worthy of note that in other instances of embolism the point of lodgement was at the branching of a major vessel. Of 11 patients on whom operation was performed, the circulation was restored in 8, including one where there had been a delay of thirty-six hours, and another seventy-two hours. But, although the circulation was restored, only 3 survived to be discharged from hospital. The mortality, however, is still higher in those cases where no operation is performed, and from the figures it appears that embolectomy is a proper and reasonable undertaking. It is pointed out that the collateral circulation of the extremities is such that emboli lodging in the brachial or even in the axillary artery are attended with more than an even chance of recovery without operation. Likewise, emboli lodging at the bifurcation of the popliteal vessel do not require surgery.

OPERATIVE TREATMENT.—Local anaesthesia is recommended. The injection should be made over the artery at the first major bifurcation below the point of definite pulsation. It will be noticed that above the embolus the vessel is round, distended, and pulsating, and at the lower limits of pulsation the firm mass of the embolus can be easily palpated. Before the artery is incised, it should be grasped, proximal to the embolus, by the fingers of an assistant and not by a clamp. The wound is then flooded and sponged with **Sodium Citrate** solution and an incision is made directly over the embolus. If the embolic mass does not promptly extrude, it may be teased out with forceps, the back pressure of the peripheral vessels being allowed to force out the long tail portion of the attached secondary thrombus. When blood commences to flow from below, the wound is approximated, edge to edge, by fine silk arterial sutures.

Embolism of the aorta or iliac vessels is best approached through the abdomen and not by the retroperitoneal route. In the event of gangrene, nothing is to be gained by early amputation. Demarcation usually occurs about the middle of the calf.

It is not sufficiently realized by physicians that an arterial embolism in cases of heart disease can be successfully removed and gangrene avoided. The operation is one of emergency, and the earlier it is performed the better the chance of success. The mortality must of necessity be high, not on account of operative difficulties, but owing to the cardiovascular disease which preceded the arterial obstruction. Once again this branch of surgery illustrates

PLATE III

ARTERIAL EMBOLISM

(H. E. PEARSE)

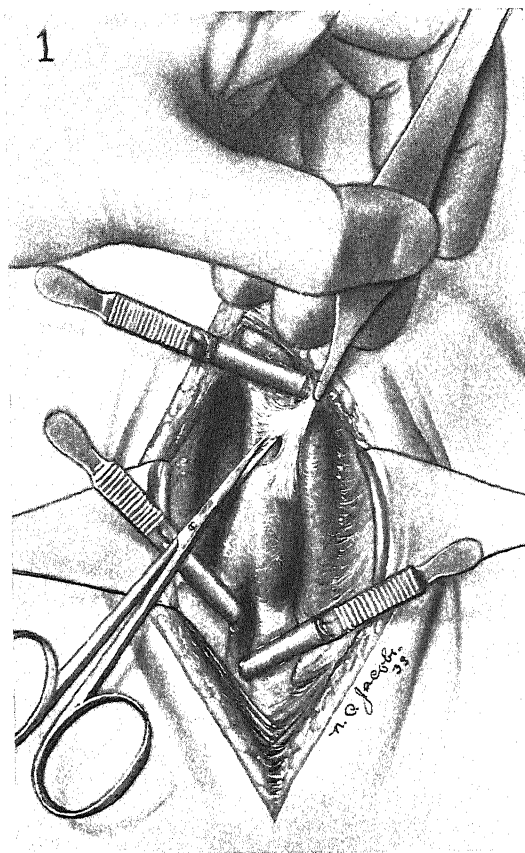


Fig. 4.—After locating the embolus the adventitia is picked up and carefully cut away from the proposed site of the arteriotomy. If this is not done strands of adventitia may be drawn into the lumen during suture and cause thrombosis.

*Plates III-VI by kind permission of
'Annals of Surgery'*

PLATE IV

ARTERIAL EMBOLISM—*continued*

(H. E. PEARSE)

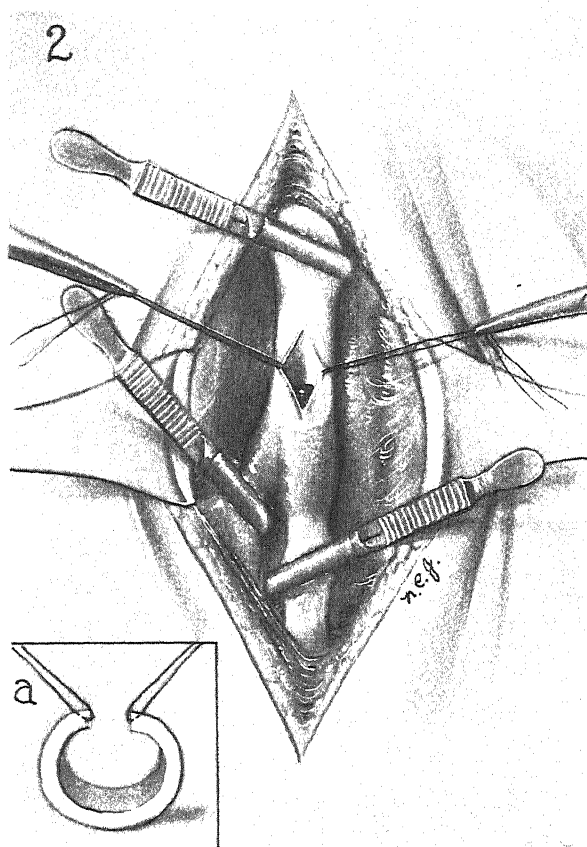


Fig. B.—The circulation is controlled by rubber-shod clamps. The opening in the artery is made just above (or below) the embolus. *a.* Shows how traction sutures may be placed into but not through the vessel wall.

PLATE V

ARTERIAL EMBOLISM—*continued*

(H. E. PEARSE)

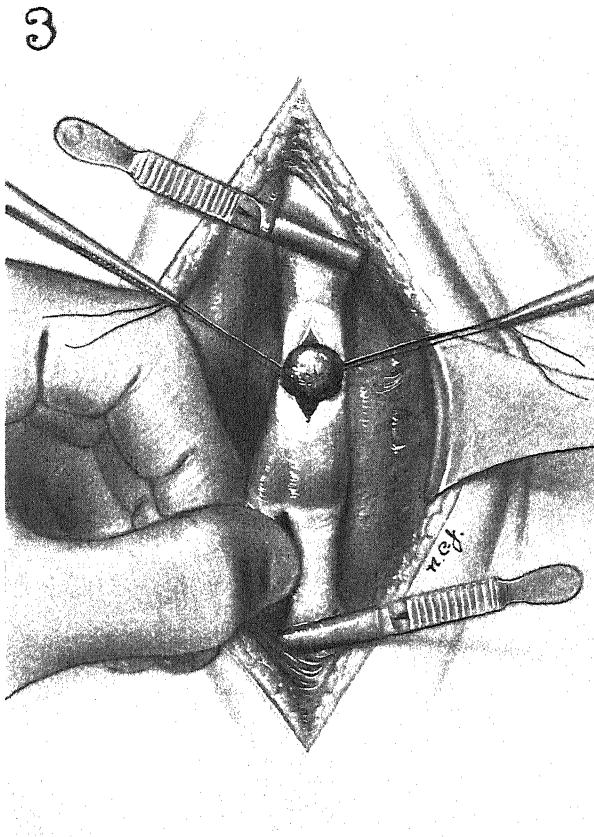


Fig. C.—The embolus is extruded by gentle compression of the artery. After removal of the embolus all fragments should be carefully flushed out.

PLATE VI

ARTERIAL EMBOLISM—*continued*

(H. E. PEARSE)

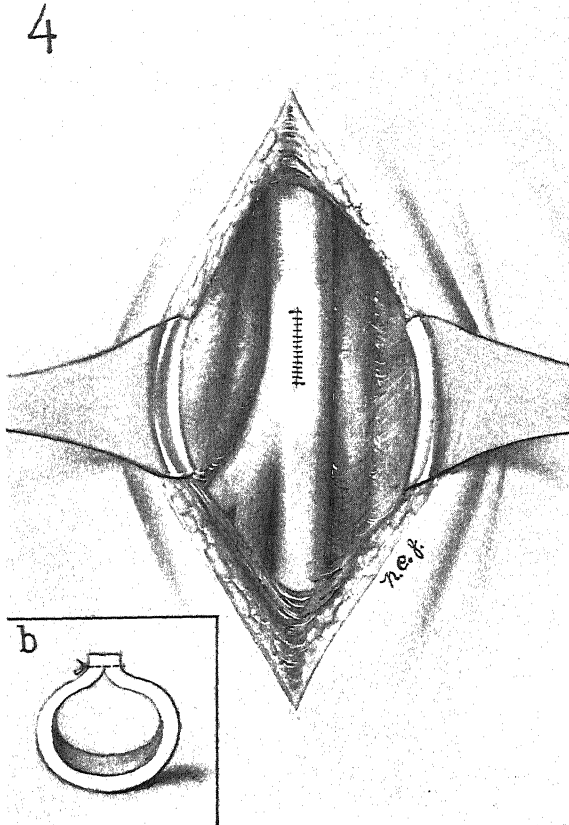


Fig. D.—The arteriotomy wound is sutured with a continuous Carrell stitch of delicate silk. A wider approximation of the intima is obtained by interrupted mattress sutures (*b*). After completion of the closure the distal clamps are removed before the proximal one in order to avoid undue strain on the suture line.

the necessity for team work. It is only by close co-operation with physicians in hospital practice that cases for embolectomy are transferred to the surgeons for operation.

H. E. Pearce⁵ states that in Sweden the majority of physicians are on the alert to utilize this operation, but elsewhere there are many neither acquainted with the early signs and symptoms of embolism nor aware of the possibilities to be derived by surgery. There is, therefore, an obligation on surgeons to acquaint their colleagues with the facts.

Pearse points out that the exact location is of extreme importance to the success of embolectomy. If it is not found where expected, two courses are open. The first is to dissect out the artery in search of the embolus, which may necessitate an extensive dissection; the second alternative is to open the artery and by means of a catheter, curette, or forceps attempt the removal of the embolus. This blind attempt may not result in complete removal, and the remaining fragment may act as a focus for thrombosis. The level of ischaemia is usually found to be 4 to 8 in. below the embolus. The obstruction of the aorta or common iliac gives a level near Poupart's ligament, that of the common femoral near the mid-thigh, of the superficial femoral near the knee, and of the popliteal near the mid-calf. The technique of operation recommended by Pearce is shown in *Plates III-VI*.

Injuries to Arteries and Ligation of Veins.—A generation ago, when the ligation of arteries was being taught to students during a course of operative surgery, great stress was laid on the necessity of avoiding injury to the accompanying vein. During and before the War it was demonstrated that this teaching was fallacious, and that the risks of gangrene were often minimized by ligation of the accompanying vein. There is, however, some difference of opinion on this subject. The reviewer has recorded from time to time in the *MEDICAL ANNUAL* various cases of impending gangrene of the lower extremity which appear to have been benefited and gangrene avoided by the ligation of the principal vein. This was more especially seen in cases in which the femoral vein was ligated near the middle of the thigh or in the upper portion of the popliteal space.

M. L. Montgomery,⁶ after a series of experiments, concluded that after ligation of the superficial femoral artery, ligation of its concomitant vein caused either no change or a slight decrease in the per minute volume flow of blood. He concluded that the vein should not be tied in treatment of acute obstructions of the main arterial supply, but he draws attention to the fact that if the obstruction is in the popliteal artery, the procedure of vein ligation is strongly supported by clinical evidence. He believes that it is better to wait the appearance of impending gangrene before ligating the vein.

J. de J. Pemberton and J. M. McCaughan⁷ believe that occlusion of the vein simultaneously with the artery results in greater intravascular pressure, which forces blood into the distal capillary beds. They refer to experimental evidence in support of this belief. From clinical experience they believe that simultaneous ligation of the accompanying vein is of definite value in selected cases—in other words, the operation is indicated in certain cases of arterial obstruction and contra-indicated in others. When the collateral circulation is inadequate, ligation of the accompanying vein is definitely indicated. When the collateral circulation is adequate it is contra-indicated on account of the risk of producing imbalance of the circulation and probably permanent cedema of the limb.

The following clinical test is suggested. If a retrograde flow of blood is obtained from the opened end of the distal arterial segment while the proximal portion is being compressed with a clamp, it is taken as an indication of adequate

collateral circulation. In fact bleeding from any portion of the peripheral arterial tree after puncture or incision when the main trunk is being compressed is a sign of adequate circulation (*Fig. 26*).

This interesting paper is concluded by saying that when the Henle-Coenen sign is positive ligation of the accompanying vein is contra-indicated, and when this sign is negative ligation of the main venous channel is indicated.

In the experience of the reviewer in cases of arteriovenous aneurysm in the lower limb as the result of injury, it is safe to ligature both artery and vein above and below and resect the area of aneurysm. In recent injuries to the femoral artery with hemorrhage or aneurysm in which there is good circulation in the foot, the vein should not be ligated. On the other hand, in cases of aneurysm in which gangrene is impending, ligation of the vein with the main artery is advocated.

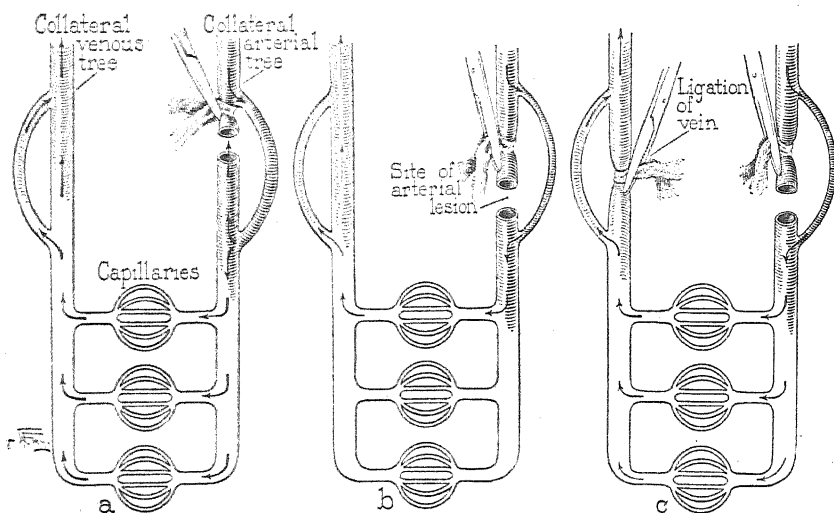


Fig. 26.—Mechanism of the Henle-Coenen test: a, Retrograde flow from, or pulsation in, artery on distal side of lesion, with proximal side occluded, denotes positive Henle-Coenen sign and indicates adequate collateral circulation. b, No retrograde flow from, or no pulsation in, artery on distal side of lesion, with proximal side occluded, denotes negative Henle-Coenen sign and indicates inadequate collateral circulation. Blood fails to reach capillary bed. c, Occlusion of main accompanying vein induces more equal distribution of blood throughout capillary bed. (*By kind permission of 'Annals of Surgery'.*)

Subcutaneous Rupture of the Popliteal Artery.—C. P. Wakeley and W. O. R. Reid^s report two interesting cases. The first patient was a strong healthy stoker. While trying to kick a football he completely missed it and fell down on account of acute sudden pain in his right knee-joint. A few hours afterwards the leg was cold. The dorsalis pedis artery could not be felt; there was no fracture. The following day sensation was absent from the foot, and the knee was considerably distended. The femoral vessels were exposed in Hunter's canal and the artery and vein ligatured. Gangrene supervened, and amputation was performed above the knee. The popliteal artery was exposed and found to be ruptured just below the opening in the adductor magnus muscle. There was a large rent in the vein at a lower level. On section, the artery was found to be quite normal. The second case was that of a boy of 15 who was

thrown from his bicycle in a collision. The popliteal artery was ligatured above and below the rupture, just below the opening in the adductor magnus. The operation was performed about thirty hours after the accident. On the third day gangrene set in and amputation was performed.

Injury to the popliteal artery at one time was said to occur occasionally when direct traction in the extended position was applied in cases of fracture of the lower end of the femur. It has been taught that as a result of the traction the proximal end of the lower fragment was tilted farther backwards into the popliteal space and this endangered the safety of the popliteal vessel. The reviewer has never seen such a case, and it has been shown by Robert Jones and others that fixed traction in the extended position does not, in fact, produce the tilting backwards of the lower fragment. J. B. Murphy many years ago referred to the danger of rupture of the popliteal artery, especially in elderly people, when forcible extension of old-standing cases of flexed knee-joint was attempted.

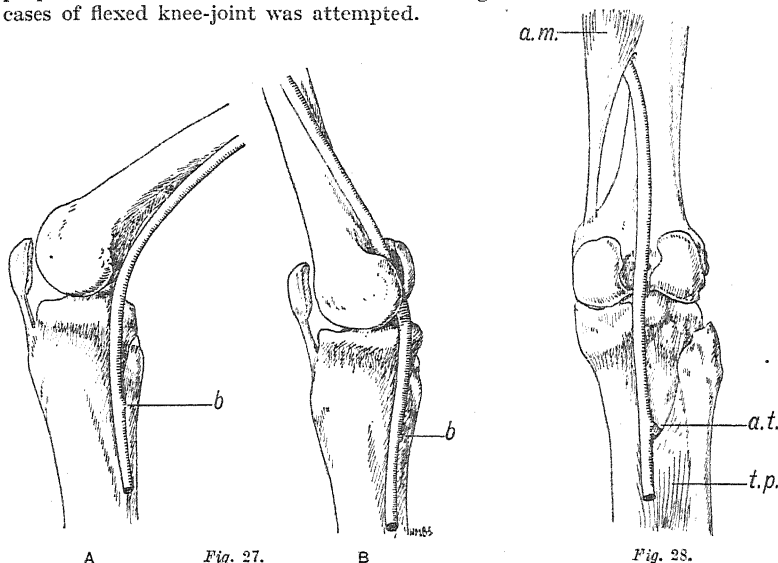


Fig. 27.—The popliteal artery in side view illustrating its relations to the skeleton: *A*, In slight flexion; *B*, In hyper-extension (abnormal) of the knee-joint. *b*, Terminal bifurcation of the popliteal artery.

Fig. 28.—The popliteal artery from behind, illustrating the structures which are concerned in the fixation of its two extremities. *a. m.*, Adductor magnus muscle; *a. t.*, Origin of anterior tibial artery; *t. p.*, tibialis posterior muscle.

(*Figs. 27, 28 by kind permission of the 'Lancet'.*)

DIAGNOSIS.—Immediately after the injury there is extreme pain. There is a stony hardness behind the knee-joint which gradually spreads upwards and backwards. There is gradual loss of sensation in the foot and toes, which extends upwards. In complete rupture pulsation in the anterior and posterior tibial arteries disappears. Pronounced swelling in the popliteal region may be absent. *Figs. 27, 28* suggest a possible mechanism to explain the injury, namely—fixation of the artery above and below and hyperextension of the knee-joint, with resultant tearing of the vessel. [In the healthy artery, when the knee-joint is flexed the vessel is usually thrown into folds and does not lie

in a straight line, indicating that the mechanism of injuries of the vessel must be more complex.—W. I. de C. W.]

TREATMENT.—It would appear from the recorded cases that **Amputation** sooner or later becomes inevitable in the great majority of cases. Immediate amputation is seldom indicated. Haemorrhage is spontaneously controlled by the pressure of the extravasated blood. [The ideal treatment in cases of early diagnosis is to try and expose the site of the injury and suture the rent. In cases where many hours have elapsed since the time of the accident, ligation of the artery and vein is the only rational procedure. Amputation can be postponed until it is seen that gangrene is inevitable.—W. I. de C. W.]

Subclavian Aneurysm.—E. Elliott⁹ deals with the subject of subclavian aneurysm. He states that **Proximal Ligation** is the operation of choice, and, if unsuccessful, may subsequently be supplemented by distal ligation with or without excision of the sac. In aneurysm of the first portion of the vessel, **Ligation of the Innominate Artery** must be done. The exposure of the innominate or the first part of the subclavian is facilitated by the resection of the inner end of the clavicle with or without the adjacent part of the manubrium of the sternum. The first successful case of ligation of the innominate artery in Europe was performed by Mr. Coppinger,¹⁰ of the Mater Hospital, Dublin. Ligation of the innominate artery on the right side is not a difficult operation provided the old, inadequate methods of approach are abandoned. Elliott states that resection of the clavicle in these operations does not impair the ultimate strength of the shoulder girdle or prevent the return of the patient to laborious occupation. Even non-union or a subsequent necrosis does not seem to interfere with the return of permanent strength.

Varicose Veins.—G. de Takáts¹¹ states that varicose veins are frequently infected and many infections can be traced to teeth or tonsils. Infection constitutes the most important contra-indication to the injection treatment. An analysis of embolic deaths following injection treatment shows that invariably two factors are present—induced phlebitis, and a prolonged immobility in bed. It seems certain that a large percentage of varicose veins harbour bacteria.

X-ray Observations in Varicose Disease of the Leg.—T. H. T. Barber and A. Orley¹² state that injections of **Abrodil** and **Uroselectan** have proved safe and helpful in examining varicose conditions of the leg in the living. On the X-ray table 10 c.c. are injected and the first picture is taken without withdrawing the needle. The remaining 10 c.c. are given and the second film is exposed. The pictures are taken in such a way that stereoscopic examination may be made. The details are described :—

1. The normal internal saphenous vein showed a slight dilatation at the level of the internal condyle of the tibia, corresponding with a constant valve in this situation. In varicose veins large ampullary dilatations were occasionally seen at this level.

2. In normal veins the fluid flowed towards the heart. Its back-flow was stopped by the first valve below the site of injection; in varicose veins the flow was both forward and backward. The backward flow was due to incompetence of the valves.

3. In the normal vein none of the solution was seen to enter the deep circulation of the leg through communicating or anastomotic vessels. In a few cases of varicose veins the opaque fluid was seen to penetrate into the deep circulation through anastomotic vessels at the level of the ankle and the knee-joint, but never through the venæ comites.

4. The rate of the flow in both normal and pathological cases was influenced by posture, rest, muscular activity, and respiration.

PLATE VII

BONE TUMOURS

(J. BORAK)



Skiagram showing Ewing's sarcoma after X-ray treatment for seven weeks.

*By kind permission of
'Archiv für klinische Chirurgie'*

PLATE VIII

BONE-GRAFTING FOR LARGE TIBIAL DEFECTS

(G. R. GIRDLESTONE)



Fig. A.—Diagram illustrating the reflection of an osteoperiosteal flap from front and inner side of the shaft of fibula.

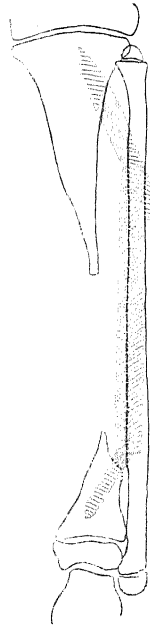


Fig. B.—Tracing from X-ray showing the long vertical and oblique peg grafts. In addition (shown stippled) there is an indication of the placing of the Delagenière graft over the Albee (which lies sandwiched between this and the deeper-lying osteoperiosteal flap from the fibula).

*Plates VII-IX by kind permission of the
'British Journal of Surgery'.*

PLATE IX

BONE-GRAFTING FOR LARGE TIBIAL DEFECTS—*continued*

(G. R. GIRDLESTONE)



Fig. C.—X-ray two months after the grafting operation.

PLATE X

BONE-GRAFTING FOR LARGE TIBIAL DEFECTS—*continued*

(G. R. GIRDLESTONE)

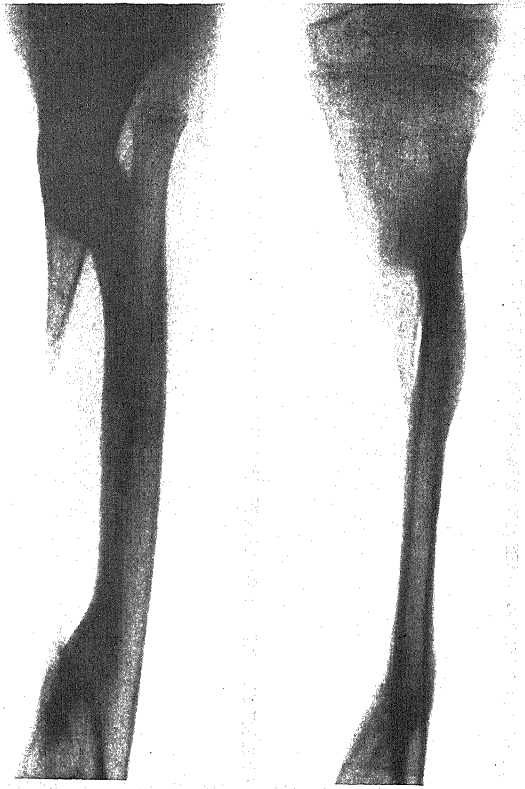


Fig. D.—X-ray four months after the grafting operation.

5. Radiography of the veins may be of considerable assistance in cases which do not respond to the usual injection treatment.

REFERENCES.—¹*Brit. Med. Jour.* 1927, Feb. 5, 225; ²*Amer. Jour. Surg.* 1933, March, 419; ³*Ann. of Surg.* 1933, June, 808; ⁴*Jour. Amer. Med. Assoc.* 1933, July 1, 7; ⁵*Ann. of Surg.* 1933, July, 17; ⁶*Arch. of Surg.* 1932, June, 1016; ⁷*Ann. of Surg.* 1932, Dec., 1103; ⁸*Lancet*, 1932, ii, 829; ⁹*Ann. of Surg.* 1932, Oct., 670; ¹⁰*Trans. Roy. Acad. of Med.* 1893, Feb.; ¹¹*Amer. Jour. Surg.* 1932, Oct., 26; ¹²*Lancet*, 1932, ii, 175.

BOILS. (See SKIN, PYOGENIC INFECTIONS OF.)

BONE TUMOURS.

E. W. Hey Groves, M.S., F.R.C.S.

Neoplasms of the long bones are of such rare occurrence that most practitioners have not the opportunity of seeing more than one or two cases, and the diagnosis is therefore often missed. Of late years, since Ewing first described a round-celled sarcoma or endothelioma which has special characteristics, a considerable number of these cases have been noted.

J. Borak¹ has considered the classification of bone tumours, their diagnosis, and treatment, chiefly from a radiological point of view. (Plate VII and Fig. 29.) He considers that *Ewing's sarcoma*, which generally attacks the shaft of a long bone, is really a round-celled sarcoma of the same nature as a lymphosarcoma. Like the latter condition, it is so sensitive to **Radiation Therapy** that this reaction may be considered of prime diagnostic importance. It is too soon yet, however, to say whether the disappearance of the tumour under X-ray treatment is ever a permanent cure or merely a temporary regression.

REFERENCE.—¹*Arch. f. klin. Chir.* 1932, Nov., 301.

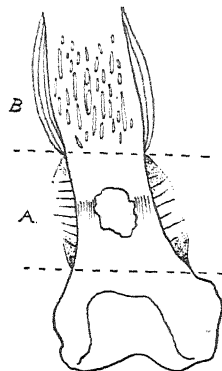


Fig 29.—Diagrammatic representation of the primary bone tumours showing the relation between the site and the type of cell. A, Spindle-cell sarcoma and its derivatives (fibro-, chondro-, osteo-sarcoma); B, Round-cell sarcoma (Ewing's sarcoma). (Modified from the 'Archiv für klinische Chirurgie'.)

BONE-GRAFTING FOR LARGE TIBIAL DEFECTS.

E. W. Hey Groves, M.S., F.R.C.S.

The restoration of continuity in the shaft of the tibia, especially when there is a considerable gap to be filled, is always a most difficult problem. The gap to be bridged is occupied by scar tissue, and this in its turn is just under the unhealthy skin. And yet this problem has to be faced fairly often when a large part of the tibial shaft has been lost by osteomyelitis. If a free graft from the opposite tibia be put in to bridge the gap, the chances of its survival and regeneration are very small, so that restoration of the limb seems impossible, and the alternatives will lie between 'irons' and amputation. And then with growth of the child comes another difficulty. The disconnected tibial ends, deprived of the natural stimulus of the pressure of the body weight, cease to grow, and the leg in adult life will be much shorter than its fellow. So that the necessity of wearing not only irons but a high boot will make a strong appeal for amputation.

G. R. Girdlestone¹ has suggested and practised with brilliant success a method of bone-grafting which overcomes these difficulties. His patient was aged 6 and had lost the greater part of the tibial diaphysis from osteomyelitis three years before. The idea of the operation was to place bone bridges from the tibial ends to the fibula, so that weight could be transmitted through the

latter bone. The whole fibular shaft was exposed through a long external incision. Tunnels were made behind the anterior tibial muscles and vessels from the fibula to the tibia. Through these tunnels short grafts from the opposite tibia were thrust, one upwards into the proximal tibial fragment, and the other downwards into the distal. The shaft of the fibula was further strengthened by the inlay of two long grafts, one bony and one periosteal. Within eight months the reconstructed bones had so far consolidated as to give a firm leg on which the boy could walk naturally. The new fibula had increased until it was as large as the shaft of the tibia would have been at that age. (*Plates VIII-X.*)

REFERENCE.—¹*Brit. Jour. Surg.* 1933, Jan., 467.

BONES AND JOINTS: TREATMENT OF INFECTIVE CONDITIONS BY DRUGS OR BACTERIAL AGENTS.

E. W. Hey Groves, M.S., F.R.C.S.

The treatment of infective conditions of the bones and joints is still very unsatisfactory. It may be true that we can usually save both life and limb, but this is at the cost of considerable mutilation, whilst only too often chronic or recurring suppuration in bones or stiffness of the joints is left to make the patient an invalid or cripple. Therefore we ought to welcome all possible suggestions which will help really to cure the bacterial infection and not merely deal with its results. Of such suggestions several have appeared recently.

Acetylcholine.—This has been used in France, and its method of action is described by R. Fischer.¹ The therapeutic action of this drug is that of vasodilatation of the smaller arteries. In fact it has much the same effect as that which usually follows sympathectomy. It is therefore employed in very much the same class of cases of painful osteoporosis that Leriche would treat by sympathetic ablation. That is to say, after injury near a joint, or when infection has taken place which threatens ankylosis, it is claimed that the repeated injection of acetylcholine will relieve the pain, increase mobility, and in due time be followed by condensation of the atrophied bone structures. The drug, which is put up in ampoules by Roche, is given in a series of daily injections of 0.1 grm. for about fifteen to twenty doses. Thirteen cases of joint injury are detailed in which this treatment was given with marked benefit.

Immetal.*—This is the name given by W. König² to a new preparation which is used for injection into the stiff joints of dry osteo-arthritis. It is a complicated fatty acid iodine preparation somewhat akin to lipiodol. Owing to its high iodine content it is opaque to X rays and can therefore be easily seen in the joints after injection. It remains in the joint for a very long period, and whilst there it provides the lubricant which the dry and eroded surfaces of the joint require. Pain in the joint is lessened and mobility is greatly improved. The injection can of course be repeated every year. (*Plate XI.*)

StannoxyI.—The action of tin and its salts in preventing suppuration when used as a local application has been known for a long time. But the researches of R. Gregoire and A. Fronin³ showed that powdered tin and its oxide are absorbed by the digestive tract and exert a marked influence in preventing or curing staphylococcal infections. J. E. Klein,⁴ of Chicago, has now used the oral administration of stannoxyI to hasten the recovery of cases of osteomyelitis. The drug is made up in 3-gr. tablets (metallic tin, 42.5 per cent; tin oxide, 7.5 per cent; amylum, 37.5 per cent; sucrose). Six to twelve of these tablets are to be given by mouth every day. The author gives details of five cases

*Bayer Products Ltd., Africa House, Kingsway, London, W.C.2.

PLATE VI—TREATMENT OF OSTEO-ARTHRITIS

(W. KÖSIG)



Fig. A.—Knee-joint immediately after injection of 18 c.c. of immetal.



Fig. B.—The same joint two years later. A considerable quantity of immetal is still present.
By kind permission of the 'Zentralblatt für Chirurgie'



of chronic osteomyelitis with persistent sinuses in which healing occurred rapidly under this treatment. Certainly this method is devoid of any risk or ill-effect and therefore might be given a trial in all cases of chronic staphylococcal infection.

Bacteriophage.—F. H. Albee,⁵ who fully accepts the general principles laid down by Winnett Orr for the treatment of infected bone lesions, nevertheless modifies his technique in some respects. He considers that the beneficial effect of the Orr treatment cannot be explained simply on the grounds of free drainage and absence of reinfection from frequent dressings. There must be formed in the wound some agent of an antibacterial nature which brings about healing. D'Herelle, the bacteriologist, of Baltimore, claims to have proved that certain bacteria do actually develop a substance which he calls a 'bacteriophage' and which brings about their own destruction. Albee claims that it is possible to obtain this bacteriophage from given cultures and to apply it to infected wounds. He therefore modifies Winnett Orr's technique in two ways. He does not use gauze for the application of the vaseline, but only a mixture of paraffin and vaseline, which is poured into the wound and there consolidates more or less firmly according to the proportion of paraffin in the mixture. Usually the mixture is 75 per cent paraffin and 25 per cent vaseline. At the bottom of the wound a rubber catheter is placed and by means of this 10 c.c. of the bacteriophage solution are injected once or twice a week. By this method he claims to make the treatment of infected bone conditions more rapid and effective.

REFERENCES.—¹*Presse méd.* 1933, March 25, 475; ²*Zentralb. f. Chir.* 1932, Aug. 6, 1907; ³*Bull. de l'Acad. de Méd.* 1917, May 29, 704; ⁴*Ann. of Surg.* 1932, Dec., 1032; ⁵*Jour. Bone and Joint Surg.* 1933, Jan., 58.

BRAIN, ABSCESS OF.

Geoffrey Jefferson, M.S., F.R.C.S.

The view has already been put forward in these pages that the majority of cerebral abscesses are encapsulated and are more chronic than acute. This somewhat overstates the actual case, perhaps, but it serves to emphasize the fact that the diagnosis, or even the suspicion, of a cerebral abscess is not an absolute indication for immediate operation. The neuro-surgeon has no wish to invade the otologists' field in so far as cranial bone infections and their treatment are concerned, but in the intracranial complications he can offer a co-operation which should be useful. F. C. Grant's¹ review of 51 cases of brain abscess, chiefly from the neuro-surgical service of the University Hospital at Philadelphia, is an important contribution. He sets out to inquire whether the high mortality in these cases is due to errors in diagnosis and localization, or whether the time at which drainage is instituted or the methods used are at fault. Localization was in fact correct in 84 per cent of the cases; wherefore he concludes that either the method or the time chosen for intervention is the reason for failure. Of these two factors, Grant appears to think that the time factor is the more important, though a technique unsuited to the particular case may fail to avert a fatality. Grant lays great stress on encapsulation, and shows that of 31 abscesses 10 were not encapsulated when operated upon within three weeks of the onset of symptoms, whilst 3 had capsules. Of those operated upon in the third or fourth week, 10 had capsules and 8 had not. All operated upon after the sixth week were fully encapsulated. The mortality in 19 unencapsulated abscesses was 100 per cent; in 30 encapsulated the mortality fell to 33.3 per cent. Grant suggests that the non-encapsulated cases should not be drained when found, as it seems that the damage inflicted by attempting to drain an area that is in a state of septic cerebritis makes matters worse. Moreover, he advises waiting as long as possible before

doing anything at all: this would not mean, of course, that the septic focus in the bone should not be dealt with radically and early. Grant admits that cases may slip through one's fingers during this waiting period, for temporo-sphenoidal abscesses may burst into the lateral ventricle or meningitis supervene from leakage. How can the clinician tell whether the abscess is a chronic one, a capsulated abscess? Chiefly by pressure signs. In the more chronic types there was papillædema in 20 out of 30 cases, in the acute ('cerebritis') types there was choke in 5 out of 18, and none at all in 11. Grant's advice on the need for inflicting as little trauma as possible in opening the abscess is good. He slips a silver tube over the cannula with which he has tapped the abscess, and after withdrawing the cannula passes a rubber tube down the silver sheath, which is itself then removed, leaving a small single drainage tube in place.

In the present writer's view the ideas expressed by Grant in this paper are sound and worthy of the close attention of otologists. Grant is no doubt wrong in assuming that if only the right time of intervention and the optimum individual method could be applied to each case the results would be perfect. But it is a very correct and praiseworthy attitude, and without it no advance can ever come. Cases of suppurative otitic encephalitis are, however, likely to continue to do badly, but there is no reason why the odd few should not recover if they were treated perfectly, whereas to-day they all die.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1932, Aug., 550.

BRAIN, FOREIGN BODIES IN. (See FOREIGN BODIES IN BRAIN.)

BRAIN, TUMOURS OF. (See CEREBRAL TUMOURS.)

BREATH, OFFENSIVE. (See HALITOSIS.)

BRILL'S DISEASE. (See TYPHUS FEVER.)

BRONCHIECTASIS.

J. F. Gaskell, M.A., M.D., F.R.C.P.

The dry form of this disease with occasional hæmorrhage is illustrated by C. Wall and J. C. Hoyle.¹ They think that the condition arises owing to inspiratory effort when the air cannot reach the alveoli.

C. McNeil² has studied the condition in childhood, and agrees with other authors that the great majority of cases arise at this period. The pathology is an actual destruction by suppuration of the bronchial wall, including muscle and cartilage. The cavity wall is formed by granulation tissue in the main, lined by a cubical non-ciliated epithelium; it therefore cannot empty itself, and retained secretion dilates it. He advocates postural drainage. On the other hand, W. P. Warner³ and H. H. Moll⁴ state that actual dilatation of the bronchi normally takes place on inspiration. Either toxic effect on muscle (Moll) or weakness of wall (Warner) prevents expiratory restitution, and so dilatation gradually takes place.

REFERENCES.—¹*Brit. Med. Jour.* 1933, i, 597; ²*Ibid.* 1932, ii, 229; ³*Canad. Med. Assoc. Jour.* 1932, Dec., 583; ⁴*Quart. Jour. Med.* 1932, July, 457.

BRONCHIECTASIS, ATELECTATIC, IN CHILDREN.

Reginald Miller, M.D., F.R.C.P.

From time to time skiagrams of children's chests will show a curious triangular shadow, starting above at the middle line and spreading out towards the diaphragmatic surface of the lung. If on the left side, this shadow will be to some extent obscured by the heart shadow. Much discussion has taken place on the nature of this triangular shadow, and collapse or consolidation

PLATE XII

ATELECTATIC BRONCHIECTASIS IN CHILDREN

(R. W. B. ELLIS)

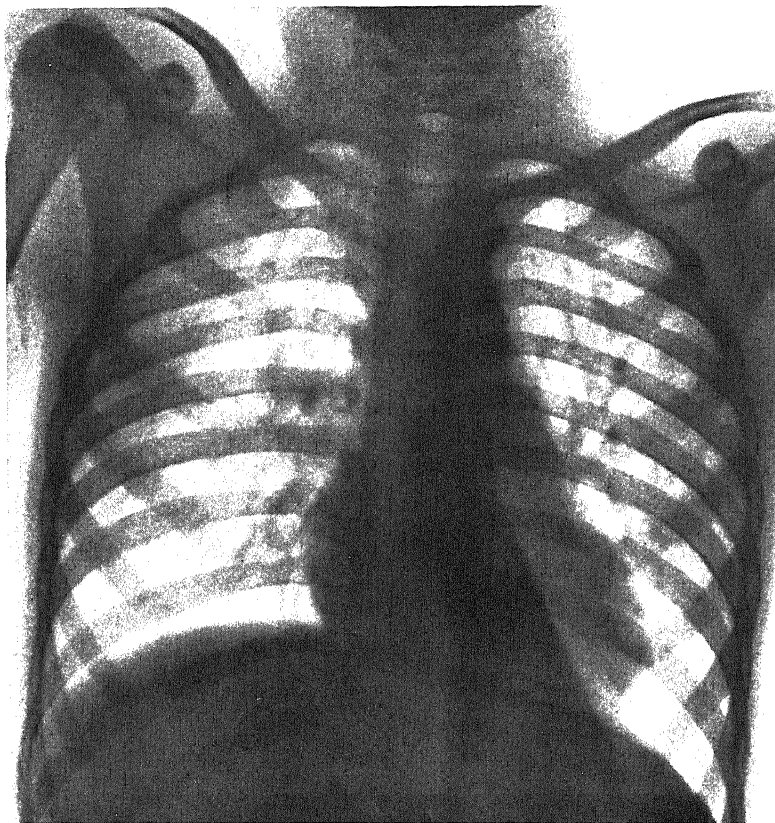


Fig. A.—Collapsed left lower lobe behind heart shadow.

PLATE XIII

ATELECTATIC BRONCHIECTASIS IN CHILDREN—*continued*

(E. W. B. ELLIS)

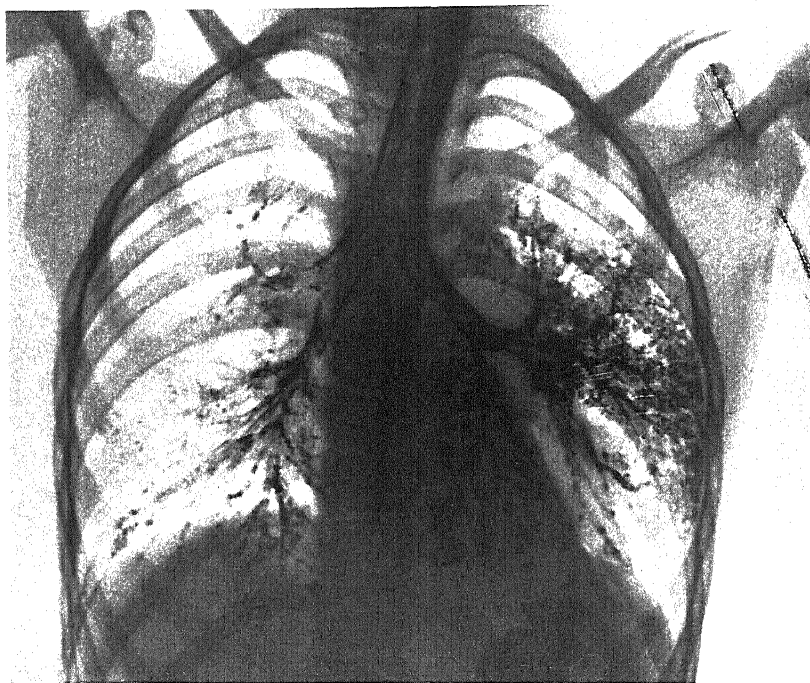


Fig. B.—Dilatation of bronchi within collapsed left lower lobe. Same case as *Fig. A.*

*Plates XII and XIII by kind permission of
'Archives of Disease in Childhood'*

of a lobe of the lung and mediastinal effusion have been the alternatives suggested. Although it cannot be said that it is necessarily the cause of every case, collapse seems undoubtedly to be the lesion usually producing the shadow in question. Recently L. Findlay¹ reported an instance in which the over-eration brought on by the inhalation of carbon dioxide caused the immediate disappearance of the abnormal shadow.

If, however, the collapse persists, secondary changes of fibrosis and bronchiectasis occur. These have been lately studied by R. W. B. Ellis,² who reviews the whole subject. The collapse of one lower lobe of the lung probably occurs most frequently as a result of, or co-incident with, bronchopneumonia in early childhood, but such possibilities as the inhalation of a foreign body or the presence of pulmonary tuberculosis have also to be considered. The collapse of the lobe may be maintained for long periods without the development of the classical features of bronchiectasis, such as foetid sputum and evidence of toxæmia: but in time the retention of the secretion of the bronchi within the collapsed area will set up bronchial dilatation and fibrosis, and from the spilling-over of the secretion into the adjacent bronchi the area of disease will tend to spread. In rare cases, even when the bronchiectatic condition is of long standing, re-expansion of the lung may take place with amelioration of symptoms (J. V. Sparks³), but the longer the condition has lasted the less likely is this to occur.

Ellis has demonstrated the facts on which his views are based in a series of radiological studies on five cases, and has been able to prove the presence of bronchiectasis in the collapsed lobe by means of lipiodol injections. Two of his skiagrams are reproduced here: in one (*Plate XII*) the collapsed lobe is seen in shadow, and in the other (*Plate XIII*) the lipiodol demonstrates the presence of dilatation of the bronchi within the collapsed lobe in the same case. (*See also X-RAY DIAGNOSIS.*)

Treatment should be directed to the re-expansion of the collapsed lung tissue in the early stages, and to prevention of secondary infection when fibrosis has occurred. Ellis regards it as doubtful if lobectomy is as yet advisable for cases of this type in childhood.

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1932, xxv, 407; ²*Arch. of Dis. Childh.* 1933, viii, 25; ³*Brit. Jour. Radiol.* 1932, v, 234.

BRONCHIECTASIS: SURGICAL TREATMENT.

A. Tudor Edwards, M.Ch., F.R.C.S.

The realization of the futility of medical treatment in the cure of bronchiectasis has given rise to the adoption of more active forms of treatment, either with a view to compression of the lung which will prevent the accumulation of secretions in the dilated bronchi and secondary excavations in the lung, or, where the disease is more localized, with a view to the complete extirpation of the diseased area.

Bronchoscopy has a definite place in the routine of treatment, particularly in eliminating the presence of a foreign body or a stricture secondary to ulceration, simple or malignant, in the bronchi. It is also of value as a means of improving the general condition of the patient before major operative procedures, for there can be no doubt that during continuance of bronchoscopic treatment improvement is definite. Unfortunately, after treatment is given up the condition of the patient deteriorates.

Simple Collapsing Measures such as pneumothorax or oleothorax are possible only where no adhesions are present; even when the pleura is free, collapse of the lung by these means may be of relatively little value in some patients in reducing the sputum, but in others may relieve symptoms

while the pneumothorax is maintained. Re-expansion of the lung often results in recurrence of symptoms, and owing to the formation of adhesions of the pleural layers only rarely can the lung be collapsed again. When the disease is unilateral and involves both upper and lower lobes, extensive **Thoracoplasty** in several stages in a proportion of cases results in most marked amelioration by steady compression keeping the cavity and bronchial walls in apposition and thereby preventing stagnation and limiting infection.

When the disease is limited to one lobe, or on the right side to the middle and one other lobe, its **Radical Extirpation** should be considered.

Formerly the mortality of **Lobectomy** for bronchiectasis was prohibitive, but the operation is now being performed with a mortality of about 12 to 15 per cent. The great problem has been the prevention of wide contamination of the pleural cavity by the highly infected contents of the bronchi in the stump at the hilum. As a result many attempts have been made to shut off the general pleural cavity by the artificial production of adhesions by performing the operation in two stages. The first group of cases published following the use of a two-stage technique showed a mortality of 60 per cent. Recently, however, J. Alexander¹ has adopted a two-stage technique which offers definite hope of improvement, the mortality rate in 18 cases operated upon by him being 16.6 per cent.

These operations necessitate careful lipiodol examinations of both lungs. In the first operation, which is performed under local anaesthesia, portions of the 6th, 7th, and 8th ribs and the intervening intercostal bundles are removed. The pleura is opened and adhesions over the diseased lobe are separated. The whole of the mediastinal, costal, diaphragmatic, and visceral pleura is gently stroked with dry gauze held on the finger. This will result in the formation of adhesions during the next ten to twelve days. The wound is closed in layers after expanding the lung with positive intratracheal pressure. Pleural aspiration is carried out when necessary during the next few days. The second stage is done under slight positive pressure anaesthesia, by re-opening the wound, freeing the diseased lobe, and passing a heavy silk ligature through the hilum, dividing it, and tying each half tightly. A further ligature is tied completely around the hilum. The chest wall is again sutured with an air-tight drainage tube placed near the hilum. After two or three days the wound is re-opened and the gangrenous lobe surrounded by loosely packed flanne gauze. This is changed daily until the lobe is removed a week later. The residual cavity granulates slowly, with closure of the bronchial fistula. Persistence of the fistula may require a subsequent plastic operation. This method appears to be as favourable as is possible for two-stage procedures.

The single-stage procedure has many advantages if proved feasible, as appears to be the case now, following in some measure the original technique advocated by H. Brunn.² N. S. Shenstone and R. M. Janes³ report a series of 14 patients operated upon by the modified Brunn's technique. The control of the hilum of the lobe is obtained by the use of a special tourniquet founded upon the principle of the nasal snare. The operation is performed by making a wide intercostal incision and division only of one of the adjacent ribs posteriorly. After the insertion of retractors all adhesions attaching the affected lobe to the surrounding structures, chest wall, diaphragm, pericardium, etc., are divided, and the ligamentum latum pulmonis is divided between forceps and ligatured. The hilum is now controlled by two special tourniquets with sufficient firmness to obstruct the blood-supply without damage to the tissues, and the lobe is removed between them. The projecting bronchial stumps are removed, and the hilum is sutured by a running suture; this in turn is covered by suturing the fringe of lung over it, and the stump is firmly buried in the

adjacent lobe. Intercostal air-tight drainage is established after closure of the chest wall in layers.

These authors report 14 patients operated upon by this technique with 2 deaths, and 1 patient operated upon by the two-stage method who died five days later. This method has many advantages over the two-stage method if it can be performed in a reasonable time, as is usually possible when adhesions are absent; and it is in much the same position in the presence of adhesions as the two-stage method, for in these cases the unaffected lobe being adherent prevents the establishment of a large pneumothorax. Unquestionably, any simple method which can produce adhesions over the normal lobe will diminish the risks of the operation; but if this is going to entail a major operative procedure, the risks appear to be unjustifiable, and at the present time the technique of the one-stage operation seems to be preferable.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1933, March, 658; ²*Canad. Med. Assoc. Jour.* 1932, Aug., 138; ³*Ibid.*

BRONCHOSCOPY.

F. W. Watkyn-Thomas, F.R.C.S.

Broncho-spirometry.—In a preliminary paper on some attempts at determining the volume and function of each lung separately, H. C. Jacobæus, P. Frenckner, and S. Björkman¹ describe a new method of physical examination of the lungs which they have named 'broncho-spirometry'. By this method, which depends on a combination of bronchoscopy and spirometry, they have estimated the volume, degree of ventilation, and gaseous exchange of each lung. Thus for the first time a method has been devised which supplies accurate information as to the function of each lung, just as cystoscopy and ureteral catheterization does for each kidney.

Spirometry alone gives only the total gaseous intake and exchange of both lungs together; thus it is impossible, for example, to decide whether or not one lung is completely collapsed. In order to separate the two lungs a special bronchoscope is necessary. At first a Jackson's tube was used, with a 'window' stopper at the proximal end, an air outlet to the spirometer, and a circular rubber band-cap close to the distal end, which could be inflated from without and thus render the contact of the tube and bronchus air-tight. An improved pattern is now used with a flexible inner tube which is passed into one main bronchus. This bronchus is blocked by inflation of the rubber cap, and the trachea is blocked by the cap around the outer tube. Thus both lungs can be examined simultaneously—one through the inner tube, the other through the main tube, each of which is connected with its own spirometer.

In the paper eleven cases are reported, and the authors' summary is so temperate and judicious that it is worth reporting verbatim: "Such a method is indisputably of great theoretical interest. . . . It would seem that the possibilities of probing deeper into the normal and pathological physiology of the lungs might become considerably enhanced by the aid of such a method. Pathological processes in the lungs present such great variations in respect of localization and spread that one would expect *a priori* to be able to make practical use of a method such as the above, providing, of course, that the technical procedure can be developed and be made relatively simple and at the same time harmless to the patient."

Bronchoscopic Observations on Post-operative Pulmonary Conditions.—Chevalier Jackson and C. L. Jackson² have observed five distinct types of post-operative pulmonary complications: (1) Atelectasis; (2) Post-tonsillectomic suppurative, in which operations about the upper air-passages other than tonsillectomy are included; (3) Foreign bodies inspired during operations about the upper airways; (4) Infarct; (5) Pneumonitis.

Infaret and pneumonitis are not further discussed, as on the material it was not possible to determine that any case was due to infaret, and 'pneumonitis' or 'post-operative pneumonia' are terms used too loosely to be of scientific value.

Atelectasis, which usually follows abdominal operations, is not, primarily, a suppurative condition, nor is the 'post-operative foreign body'. In both these conditions abscess formation is a late complication and may not occur at all.

In the 'post-tonsillectomic suppurations' (a term which, we must remember, includes pulmonary suppuration following any operation on the upper airway) abscess formation is early and frequent. The suppuration in such cases is usually attributed to inspiration of blood during operation, and it is pointed out that such inspiration is aided by pressing down the base of the tongue with a spatula and thus preventing swallowing. The authors do not accept this explanation. They remark that blood is inspired in the great majority of tonsil operations, and lung abscess is, fortunately, a rare complication. They also cite the remarkable case of a child who inspired a large piece of tonsil at operation and kept it for seven months in the left lower lobe bronchial stem. When the fragment was removed it was not putrid and the stroma was preserved. Further, in these cases the suppuration is usually a parenchymatous abscess bursting into a bronchus. On these grounds the authors believe that post-tonsillectomic abscess is not usually an inspiratory infection (although it would not be right to say that inspiratory infection could never produce such an abscess), but that it is, rather, an infective embolic process.

The principal characteristics of the different conditions are summarized by the authors in the following table :—

POST-OPERATIVE PULMONARY COMPLICATIONS.

<i>Post-tonsillectomic Suppuration</i>	<i>Post-operative Atelectasis</i>	<i>Post-operative Foreign Body</i>
1. Follows operations about the upper air passages, most often tonsillectomy	1. Follows abdominal operations	1. Follows inspiration of foreign body during operation
2. Onset sudden	2. Onset sudden	2. Onset gradual, even if obstructive atelectasis is produced by the foreign body.
3. Primarily suppurative	3. Not primarily suppurative	3. Not primarily suppurative
4. Abscess forms early, namely, within a few days, and very rapidly	4. Abscess late, if at all	4. Abscess late, if at all; a year or more in cases of steel foreign body; three months or more in cases of tooth, and it is not in any case a cavity associated with fluid level but rather a condition of drowned lung
5. Abscess shows cavity and fluid level early	5. Drowned lung first suppurative feature, if any	5. Local suppurative bronchitis. If complete obstruction drowned lung may follow atelectasis
6. Expectoration of pus and blood at onset very foul, gangrenous	6. Expectoration at onset absent or scanty, rarely, if ever, purulent or bloody, or odorous	6. Expectoration at onset absent or scanty; if a tooth, mucopurulent in a few cases; if non-obstructive steel instrument, may be months or years
7. Breath very foul at onset	7. Foul breath not a feature	7. Foul breath not an early feature

Bronchoscopy is advised at the earliest possible moment in all varieties of post-operative pulmonary complications. Once suppuration is established,

the prevention of bronchiectasis depends largely on the drainage of the 'septic tank' by aspirating the thick pus instead of waiting for putrefaction to thin it enough to allow it to be expelled by coughing. The authors warn us against the use of drugs which inhibit the cough reflex, against atropine which makes the secretion more viscid, and against operating during, or shortly after, influenza or other acute respiratory infections.

In last year's MEDICAL ANNUAL (p. 496) Benjamins was cited as upholding the dual route of lung infection after tonsillectomy—(1) by direct inhalation, (2) by embolism. He held that the high rate of lung abscess in American statistics was primarily due to the practice of removing tonsils while still acutely inflamed. (*See also PRE-OPERATIVE AND POST-OPERATIVE TREATMENT.*)

REFERENCES.—¹*Acta Med. Scand.* 1932, lxxix, 174; ²*Ann. of Surg.* 1933, April, 516.

BRUCELLA ABORTUS INFECTIONS. (*See UNDULANT FEVER.*)

BUBO, CLIMATIC, AND INGUINAL GRANULOMA. (*See also LYMPHOGRANULOMA INGUINALE.*)

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

The important discovery that these two diseases are caused by a filtrable virus and constitute an additional venereal disease has done much to clarify our ideas on the subject, the recent work on which was dealt with by H. Stannus¹ in his presidential address at the Tropical Diseases Section of the Royal Society of Medicine. He includes in this category chronic elephantiasis and ulceration of the vulva, and the genito-ano-rectal syndrome, together with inflammatory stricture of the rectum, on the strength of a positive *Frei's intradermal test*; but N. H. Fairley in the discussion considered it premature to include the last-named disease in the group on the basis of that test. After references to the history of the subject, Dr. Stannus deals with the evidence for the venereal origin of the disease, and then describes *Frei's test*, which is performed by using as an antigen a saline dilution of pus sterile to bacteria aspirated from a softened climatic inguinal bubo heated to 60° C. on two consecutive days and kept at a low temperature, 0.1 c.c. of which is injected intracutaneously. An inflammatory area at least $\frac{1}{2}$ cm. in diameter, with a small central zone of necrosis after forty-eight hours, constitutes a positive reaction. The identity of the causation of the two diseases is established by the fact that an antigen from a climatic bubo gives a positive reaction in cases of lymphogranuloma inguinale, and vice versa. On the other hand, soft chancres give negative results. Further, in 22 Paris cases of rectal stricture all but two gave positive *Frei's* reactions. The next advance was made when Hellerström and Wassen in Stockholm produced in monkeys a characteristic meningo-encephalitis by intracerebral inoculation of saline suspensions of gland tissue from five cases of lymphogranuloma inguinale, passed the disease from one animal to another, and obtained positive *Frei* reactions in the animals, which developed a generalized infection involving the glands, liver, and spleen, etc. The virus in gland emulsions passes through a fine filter and it is destroyed by heating to 60° C. for eighty minutes. The virus has also been recovered by Levaditi and others from a case of stricture of the rectum.

The symptoms and pathology are next dealt with by H. Stannus, and the very close relationship between the virus and the lymphatic system is shown, and the differences in the distribution of the lesions in males and females is explained by the differences of the lymphatic distribution in the two sexes. The first lesion is a transitory herpetiform ulcer appearing a few days after coitus, and this is followed in two or three weeks by a lymphangitis spreading to the inguinal glands, with or without beads of suppuration in them according

to the acuteness of the case, sometimes accompanied by prolonged fever and a moderate neutrophil leucocytosis. In chronic cases the enlargement of the glands may be extensive, but their removal may result in lymphatic obstruction and elephantiasis. In the female the infection spreads back to the anorectal gland and perineum, and rectal stricture may eventually result. As the female remains infective much longer than the male, the much greater frequency of the disease in males is explained.

G. M. Findlay² records important experimental work on this subject which confirms the discovery of a filtrable virus as the cause of the disease, and he further shows that the animal reactions in mice, monkeys, and guinea-pigs to the virus of climatic bubo are identical with those with the virus of inguinal granuloma. Moreover, the sera of patients suffering from climatic bubo mixed with emulsions of infected mouse brains protected against infection in the same way that Levaditi had shown the serum of lymphogranuloma patients protected against the virus of such cases, while Findlay has also shown that the sera of Paris lymphogranuloma inguinale protects against the mouse virus of climatic bubo. The identity of the two diseases appears, therefore, to be fully established, and he suggests the former term as most applicable to both affections, for the disease can no longer be considered to be of climatic origin.

In a further comprehensive paper G. M. Findlay³ reports animal experiments with the filtrable virus of fifteen cases of climatic bubo which show that the essential change is a proliferation of the cells lining the lymphatic channels, commencing with those of the cutis vera at the site of infection and spreading to the glands, and also affecting the lymph channels in the brain and cord after intracerebral inoculation, with the formation of definite lymphomata, but without degenerative changes. He thinks that the bodies described by Gama and Favre may be nucleolar extrusions. Injections of the virus into the groins of monkeys and guinea-pigs resulted in buboes in one-third of them, but the infection tends to die out on passage.

The clinical side of the subject is dealt with by H. Willoughby,⁴ based on his experience as a port health officer, which has led him when examining native crews to 'rub down' the armpits and groins as an aid in the detection of ambulatory plague and climatic bubo. In the treatment of the disease he advises protein shock in the form of four to six injections of **T.A.B. Vaccine** intravenously at four- to five-day intervals in doses increased by 50 million at a time from 100 to 300 millions. A new drug, '**Solgenol B**', has given good results in uncomplicated cases in doses of 0.25 to 0.5 grm. intramuscularly daily up to a total of about 15 grm. Suppurating glands should never be incised, but they should be removed without rupturing their capsules to avoid wound infection.

T. B. Menon⁵ obtained a history of a primary sore on the penis in 29 of 39 cases.

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1932, Nov., 7; ²*Lancet*, 1932, ii, 11; ³*Trans. Roy. Soc. Trop. Med. and Hyg.* 1933, June 29, 35; ⁴*Jour. Nav. Med. Ser.* 1932, July, 202; ⁵*Ind. Med. Gaz.* 1933, Jan., 15.

BURNS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Attention was drawn in the MEDICAL ANNUAL for 1933 (p. 87) to the use of strong solutions of **Tannic Acid**, 5 per cent in children and 10 per cent for adults, instead of the standardized 2½ per cent solution which up till recently was used as the routine treatment. The solution is sprayed over the burnt area every hour for the first twenty-four hours and then no further treatment is needed for several days. It is very important in severe cases not to commence the local treatment nor to give an anaesthetic until shock has been countered.

The patient is put to bed and **Morphia** is given for pain. The burnt area is gently exposed and artificial heat applied by means of a cradle with electric lamp bulbs. Later, under gas-oxygen anaesthesia, the burnt area is cleansed. Loose epithelium is removed and raw surfaces are gently swabbed with ether or alcohol. The coagulating solution is then sprayed over the raw surface from an atomizer. The solution quickly dries, aided by the heat from electric lamps or an electric drier. The process is repeated every hour for about the first twelve hours. It is an advantage to add acriflavine, 1-1000 solution, to the tannic acid in order to control sepsis. The solutions must be made fresh.

J. H. Hunt and P. G. Scott¹ believe that the 5 per cent solution tannic acid is the best; 10 per cent may irritate the skin or do further damage. A soft camel-hair brush is preferred to a spray. If blood or serous exudation is free and a spray is used, it is the surface of the blood or serum which is coagulated and fluid collects beneath. Such exudates are wiped away by the brush, allowing the tannic acid direct access to the surface of the burn. In burns involving hands, elbows, and ankles, adequate splinting in the form of folded plaster-of-Paris bandages is advised.

These writers summarize an interesting account of the treatment of out-patients as follows:—

“In this series of 63 consecutive cases a modification of the recognized tannic acid method has been used for the out-patient treatment of burns and scalds.

“If the crust formed by the recognized method is covered with a dressing and bandage it tends to soften, become septic, and detached. The difficulty has been overcome in this series of cases by reinforcement of the crust, either with a thin layer of gauze, gauze and collodion, or collodion alone. The results have been very encouraging, especially in those burns of the face and hands which often give so much trouble. Details of the three methods are given.

“In the majority of second and third degree burns the method of choice, and one that reduces pain and sepsis to a minimum, is to paint the burned area with a 5 per cent solution of tannic acid in water, and apply a dressing soaked in the same solution. No anaesthetic is required. Next day when the dressing is removed the burn will be found covered with a thin brown crust, and the dressing is repeated. On the third and fourth day this crust is reinforced with collodion. The surface then remains hard and dry and the crust separates towards the end of the second week, exposing the new epithelium which has grown beneath it.

“For the first-aid treatment of all burns and scalds a plea is made for the use of dressings soaked in a 5 per cent solution of tannic acid in water (gr. 20 of the powder to 1 oz. of warm water).

“Vigorous cleaning and scrubbing are avoided, as we find these do more harm than good.

“The tannic acid solution is applied with a soft camel-hair brush ($\frac{3}{4}$ in. wide) instead of a spray.

“Softening of an ordinary tannic acid crust, when covered up, is usually thought to be due to diminished evaporation from its surface. This series of cases rather suggests that evaporation plays but little part, and that the softening is nearly always due to sepsis following mechanical damage, from the rubbing of a dressing. The effect of reinforcement is entirely mechanical. The strengthening is most essential at the edge of the crust where it is in contact with skin and its organisms; here it is that separation first occurs from the friction of dressings and organisms first gain a hold. The agents used for reinforcing the crust all help to prevent this separation at the edge, and it is to this, we believe, the beneficial effect of reinforcement is due.”

H. H. Fisher² describes four cases of burns caused by an explosion in a submarine. He makes some interesting points and emphasizes the value of **Ether** as a cleansing agent before the application of tannic acid. The removal of grease and oil is essential for the formation of a coagulum. He shows that the areas covered by coagulum supplicated less and healed more quickly than those found to be involved later and which were untouched by the tannic acid at the commencement of treatment. He agrees with all others that local treatment should be directed to keeping the wound absolutely dry.

P. H. Mitchiner³ discusses the cases of deaths from burns. The mortality from initial shock is only about 2½ per cent. He points out that six to twelve hours after a burn the loss of blood serum from the burnt surface is very great. This accounts for the extreme thirst and restlessness of the patient. The collapse which ensues is responsible for 80 per cent of the deaths after burns. This collapse is due both to the toxæmic absorption and to the extensive loss of fluid. The administration of **Fluid** intravenously, subcutaneously, and orally is, therefore, strongly indicated. Later comes the stage of septic toxæmia, which seldom, if ever, occurs after the tannic acid treatment. Furthermore, the tannic acid treatment diminishes the loss of fluid from the burnt area which is so serious and so often fatal during the first twelve hours. Mitchiner recommends a 2 per cent solution of tannic acid in 1-2000 **Perchloride of Mercury** for the treatment of all minor burns or scalds. The perchloride solution is used because it is a precipitant of proteins. Gauze compresses are soaked in the solution and applied to the burn. It is unnecessary to redamp the gauze or to change the dressing frequently. The technique is as follows: A compress consisting of either six layers of sterile gauze or three layers of lint should be thoroughly soaked in the solution of 2 per cent tannic acid and 1-2000 perchloride of mercury. It is applied over the entire burnt area. It is then bandaged in position. The whole of the outside of the bandage is sprayed over with the solution to ensure that the dressing is thoroughly wet. Such a dressing can be left in position untouched for a fortnight in the case of small burns and scalds, and three weeks where large areas are involved. When the dressing is removed, the scab will usually separate completely from the burnt area. [It will be seen in this communication that a treatment for burns is recommended analogous to the treatment for varicose ulcers with unchanged bandages and with the closed method of treatment of osteomyelitis as introduced by Winnett Orr.—W. I. de C. W.]

C. G. Mixer⁴ deals with contractions of the neck following burns. He recommends **Tube-grafts** taken from the sides of the chest.

REFERENCES.—¹*Lancet*, 1932, ii, 774; ²*Jour. Roy. Naval Med. Assoc.* 1932, July, 211; ³*Lancet*, 1933, i, 233; ⁴*New Eng. Jour. Med.* 1933, Jan. 26, 190.

CANCER, RADIUM TREATMENT OF. *Stanford Cade, F.R.C.S.*

The tenth annual report of the Medical Research Council on the medical uses of radium¹ gives a concise summary of the work, both clinical and research, carried out at the various centres in association with the Council. The most striking feature is the increase in the use of radiation for the treatment of malignant disease. This is clearly shown in *Table I*, which is compiled from the records of ten different institutions, no one of which 'specializes' in radium therapy, but where radium is employed when necessary.

It is a matter of significance that fewer cases were treated by surgery alone than by radium alone, while radiation treatment of some kind entered into the therapeutic measures adopted in no less than 67·5 per cent of all cases quoted. This alone is an indication of the progress of radiation therapy. From this report it appears that in the general hospital without a specialized radium

service interest centres around three groups of cases—cancer of the mouth, breast, and uterine cervix. In the first of these groups, oral cancer with glandular metastases remains the most difficult problem, and, in spite of all methods, expectation of life for the patient in this group is small. Nevertheless, the present position is that glossectomy has been superseded by radiotherapy, and the latter, even when able to do nothing else, can often make the surviving space of life much more tolerable for the patient. In cancer of the breast interstitial radium therapy, with or without surface radium, is the favourite method. In uterine cancer the most favoured method consists in the local application of radium to the cervix and fornices, followed by high-voltage X rays or gamma radiation applied externally.

Table I.—METHODS USED IN THE TREATMENT OF CANCER.

METHOD OF TREATMENT	NO. TREATED	PERCENTAGE OF NO. TREATED
Surgery alone	758	32.5
Radium alone	761	32.6
X rays alone	255	10.9
Surgery + radium	225	9.6
Surgery + X rays	181	7.8
Radium + X rays	119	5.1
Surgery + radium + X rays ..	34	1.5
All methods	2333	100.0

The increase in numbers treated by radium is also confirmed by the figures of the Tenth Annual Report of the British Empire Cancer Campaign.² Although these figures are a mere fraction of the whole, they are fairly representative. Whereas in the report for 1930 the number of cases of cancer recorded as being treated by radium alone during one year was 1129, in that for 1933 the number has risen to 4952. The number of clinical 'cures', based on three years' freedom from the disease after treatment, was 68 in 1930 and 415 in 1933—a remarkable increase in such a short period as three years. It shows that whereas the number of cases treated has increased by four times, the three-year 'cures' have increased by seven times, so that it would appear that the technique of radium therapy continues to improve. This is further illustrated in *Table II* from the Marie Curie Hospital.³

Table II.—CANCER OF THE CERVIX: MARIE CURIE HOSPITAL, LONDON.

YEAR	NUMBER TREATED	LIVING AT THE END OF:								Living Dec., 1932
		1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	
1925* ..	14	14	12	10	7	6	6	5	4	4
1926 ..	59	46	32	28	19	16	14	12	—	12
1927 ..	57	44	32	26	19	18	16	—	—	16
1928 ..	85	82	58	51	43	40	—	—	—	40
1929 ..	110	97	74	55	46	—	—	—	—	46
1930 ..	136	123	93	71	—	—	—	—	—	71
1931 ..	126	113	77	—	—	—	—	—	—	77
1932 ..	114	102	—	—	—	—	—	—	—	102

Total treated: 701. Living at 5 years: 36 = 27.7 per cent. Living Dec., 1932: 368.

* Three months.

Table III shows the survival rate over the period 1925-32 in 225 cases of cancer of the tongue treated by Stanford Cade.³

Table III.—CARCINOMA OF THE TONGUE: SURVIVAL RATES, 1925-1932.

YEAR	TOTAL CASES	NO. ALIVE	YEARS OF SURVIVAL
1925 ..	18	2 (11%)	7
1926 ..	16	3 (18.7%)	6
1927 ..	16	3 (18.7%)	5
1928 ..	21	6 (28.5%)	4
1929 ..	51	14 (28.2%)	3
1930 ..	46	12 (26%)	2
1931 ..	34	15 (44.9%)	1
1932 ..	23	20 (86.9%)	—
Total ..	225	75 (33.3%)	

In a critical analysis of radiotherapy in the treatment of cancer Professor G. Forssell⁴ states that during the last decade reliable news from many sources indicates that in certain forms of cancer permanent cures in not inconsiderable numbers have been obtained by radiotherapy. The results from various places, however, differ vastly, and give rise to the assumption that certain definite conditions are necessary for the successful employment of radiotherapy in cancer. Thus the questions arise: What has been gained by radiotherapy? How have positive results been obtained? What measures should be adopted to improve results?

Final Results of Solely Radiological Treatment.—An exact comparison between the effects of surgical and radiotherapeutic treatment is only possible if the *absolute percentage cure* is considered. For this purpose it is essential to secure the percentage cures in proportion to the total number of cases examined. In surgical statistics operable cases only are considered. In radiological statistics a large percentage of inoperable and border-line cases are included. G. Forssell's⁴ statistics for Sweden show:—

1. In cutaneous cancer in operable cases 78 per cent of permanent healing. Surgical results gave 65 per cent.

2. In cancer of the lip, operable cases without glandular metastases: radiotherapy 86 per cent of cures; surgery 73 per cent.

3. In cancer of the mouth, without metastasis: radiotherapy has given 55 per cent of five-year cures; surgical statistics for cancer of the tongue without metastasis show a cure percentage of 41.

4. Carcinoma of the cervix has given an absolute percentage cure of 20.6. The absolute percentage with surgery is 18. In operable and border-line cases: 40 per cent by radiotherapy, as compared with 35.6 per cent from radical surgery.

5. In carcinoma of the body of the uterus, the absolute percentage cure by radiotherapy is 43.5, by surgery 43. In operable and borderline cases the corresponding figures are 60 and 58.5 per cent.

Final Results of Radiotherapy in Combination with Surgery.—Combination of radium therapy and surgery is chiefly applied in the treatment of malignant cervical glands, cancer of the breast, and neoplasms of the maxillary-ethmoidal area. Just as the technique for exclusive irradiation was developed, so has this combined method been worked out. It consists of pre-operative irradiation to reduce the tumour, insertion of radium during operation, and post-operative irradiation.

Malignant Cervical Glands.—Fixed glands are treated by radiation only.

Freely movable glands (condition of primary lesion being satisfactory) are removed. If there are no palpable glands, surgery is not considered desirable, as in the absence of palpable metastases the results are not improved by the clearance of the glandular area. Post-operative irradiation is always desirable, either by surface radium or X rays.

Cancer of the Breast.—Forssell's statistics for combined radiological and surgical treatment over a period of ten years are of great importance. In 75 cases where post-operative treatment was carried out, 29 per cent were symptomless for five years. In 45 cases of pre- and post-operative treatment, 40 per cent were symptomless for five years. The average five-year result with surgery alone is 20 to 23 per cent, with combined treatment 39 per cent. Thus the end-results are nearly 100 per cent better by the combined method. Results of pre- and post-operative irradiation are greatly superior to merely post-operative irradiation.

Maxillary-ethmoid Cancer.—Combined surgical and radiological methods in this situation have been worked out independently both in France and in this country. A. Hautant, O. Monod, and A. Klotz⁵ have treated 21 cases from 1921 to 1928: of these 9 are alive, and 8 are free from disease for periods of two and a half to eleven years. They are of the opinion that it is always necessary to excise the growth, and they advocate the transfacial approach. The operation is carried out with the intention of removing the whole tumour with a margin of healthy tissue. Curettage and piecemeal removal is to be avoided. The surgical intervention is followed immediately by the application into the cavity of radium in several containers, screened by 1 mm. of platinum. A dose of 20 millicurie-destroyed is distributed over four to five days, never exceeding the latter. The technique used in 21 cases during the past eleven years has given 38 per cent cures of from eleven to two and a half years.

In this country the combined surgical-radiological treatment has been developed by W. D. Harmer and S. Cade.⁶ Their method differs in many essential respects from that employed at the Paris Radium Institute. Access to the tumour is obtained by fenestration of the hard palate and never through the face. Irradiation is carried out in stages. The method can be summarized as follows: (1) Preliminary high-voltage X rays; (2) Biopsy; (3) Fenestration of hard palate, providing drainage, free exposure, and access to tumour; (4) Removal of the greater part of the tumour and thorough irradiation of the cavity, followed by further external irradiation if necessary. This method has been employed for over ten years with safety and very little distress to the patients. The results have been undoubtedly better than those formerly obtained by surgery or diathermy alone. The prognosis depends upon the type of growth. Thirty per cent of long-standing results can be confidently expected.

Value of Radiotherapy as a Palliative Measure.—The value of radiotherapy cannot be assessed by the 'five-year cures', as a great percentage of patients not permanently cured receive more or less lasting freedom from symptoms and alleviation of severe suffering. This must be emphasized, as there is a tendency to judge any new method of treatment of cancer from the mortality statistics alone. The palliative value of radiation, if considered from the numbers of cancer patients, is of far greater importance, as here it becomes the sole method of treatment which can be offered to the patient. The Swedish Cancer Association statistics show that only one-third of those seeking advice can be dealt with by surgery, and of those who submit to operation, at the most only one-third are definitely relieved. It is thus seen that of the large number of cancer patients, only 10 per cent are permanently healed by excisional surgery.

For the vast majority (90 per cent), so far only radiotherapy can offer any help. It is difficult to estimate with accuracy the palliative effect of radiation, but the following figures are significant, as they indicate prolongation of life from treatment. N. Westermarck⁴ analyses cases that *died* from cancer of the breast as follows:—

Untreated: average life of 31 months.

With operation: average life 39 months.

With operation and post-operative irradiation: average life 49 months.

With pre- and post-operative irradiation: average life 61 months.

Local recurrence after adequate irradiation is comparatively rare.

Local recurrence after surgery is 55·7 per cent: after combined treatment 34·6 per cent. The development of distant metastases is, of course, not affected.

Besides actual prolongation of life, the palliative effects of radiation can be gauged by the frequency of primary healing. In the six years 1921–7, 4470 patients were examined at the Radiumhemmet, of whom two-thirds received radiological treatment only. Of these, 38 per cent obtained primary healing and freedom of symptoms. Half the cases were patients with uterine, cutaneous, or lip cancer. Healing took place in 92 per cent of skin cancer, 78 per cent of lip cancer, 58 per cent of uterine cancer. Palliation must not be considered as useless, in spite of local recurrences, as the incidence of recurrence is diminished and the interval period of freedom from symptoms increased.

Principles of Successful Radiation.—In the treatment of cancer, only the best treatment can legitimately be countenanced. Inefficient treatment inevitably means that the only chance the patient has is being wasted. In radiological treatment certain cardinal principles must be recognized, if full benefit is to be obtained:—

1. Success does not depend on 'radium', but on *radium efficiently applied*.

2. Indications for radiotherapy are to be found in about 50 per cent of all cancer cases.

3. The palliative value of radiation, apart from the possibility of a permanent cure, must be recognized, and calls for a different technique.

4. Combined radium and surgical treatment has improved end-results in certain localizations to such an extent that it must be recognized as the treatment of choice.

5. The chief causes of failure in suitable cases are insufficient resources, inexperience, and lack of knowledge of the natural history of the disease.

6. A combined radium-surgical treatment is doomed to failure until radium therapy is understood and admitted to be the primary means of attack, and not a subsidiary measure.

7. Inefficient irradiation is useless and should not be undertaken.

Cancer of the Stomach.—As radium so far has done little to improve the progress of carcinoma of the stomach, it is interesting to note the report of A. Jentzer,⁷ describing a method of combining radiation with excision, employed by him for twelve years. Pre-operative irradiation is given by means of radium plaques. Filtration is important, only gamma rays being used. Three weeks after radiation, resection with the diathermy is done; this is supplemented by the insertion of seeds containing 0·5 to 1 mc., a total up to 16 mc. having been used. If total removal of the gastric neoplasm is not practicable, the tumour is treated by interstitial irradiation with seeds. Post-operative treatment consists in intravenous injection of radon. As much as 40 mc. have been injected at one time. Of a total of 24 cases so treated, 5 cases have survived over 5 years (1 case, 10 years; 2 cases, 8 years; 1 case, 7 years; 1 case, 6 years), and 5 cases from 1 to 5 years. All the patients are reported as being in good health.

Effect of Radiation on the Blood.—The widely differing and contradictory accounts of the effects of radiation on the blood, their clinical importance to the patients, and the use of blood-counts as an index of safety in workers connected with radium, has led various workers to re-investigate the whole problem. G. White Phillips,² working at the Westminster Hospital Radium Annexe, attempted to determine the blood changes that actually occur during and as a result of radiation treatment of cases of malignant disease by radium or X rays. That considerable fluctuations of the various constituents of the blood occur in normal individuals has been demonstrated by numerous observers; considerable caution, therefore, must be exercised in attributing changes to any particular factor. It is obvious that before conclusions are drawn changes observed in the blood of irradiated persons must be compared with a series of blood-counts on a number of healthy people. White Phillips chose as controls a series of hospital nurses, and compared the results with a similar series of patients with malignant disease undergoing radiation treatment. Minute details of technique in the counts were carefully observed so as to make the conditions under which the counts were made as identical as possible. The conclusions of these observations were as follows: (1) In no case following massive doses of radiation was there an anæmia produced; (2) The white cells were not materially altered in any way, and a definite leukopenia did not occur; (3) A low lymphocyte count was found in most of the cases of malignant disease treated by radium.

R. H. Simpson,² working at St. Bartholomew's Hospital, endeavoured to determine the physiological variations of the normal count. A large number of counts were carried out on workers in the Pathological Department, with elaborate controls as regards technique and the personal equation. The results can be summarized as follows: (1) Variations to a maximum of approximately 10,000 cells occur in the total leucocyte count at different times. These variations are due chiefly to the polymorphonuclear cells. (2) The total leucocyte count during the day-time is lowest between 10 and 11 a.m., and highest between 3 and 4 p.m. (3) Rapid fluctuations can be appreciated in counts taken as frequently as every minute.

These findings indicate that no reliance can be placed on any single count, or on a small series at short intervals. They do not in any way indicate that laxity as regards precautions against undue exposure in radium workers is to be permitted. That a fall in lymphocytes does occur after prolonged irradiation with an amount of radium varying from 50 mgrm. upwards, has been the experience of nearly all workers. It is also recognized that eosinophilia does occur in radium workers, and, as a rule, precedes other blood changes. The interpretation of the blood picture remains, however, a perplexing problem.

Protection of Radium Workers.—The question of protection of workers becomes of primary importance in the use of mass radiation by means of 'bombs' of 3 gm. or more. R. Sievert³ emphasizes the necessity of protection. He advises that, in the construction of a mass radiation centre, the protection provided should be sufficient to ensure that radiation penetrating into adjacent rooms should not appreciably exceed that which is normally present everywhere owing to the radio-activity of the earth's crust. For this reason, the 'bomb' should be preferably located in the basement, and by the use of iron-ore concrete the thickness of the walls can be considerably reduced.

Biological Effects of Radiation.—The Strangeways Research Laboratory at Cambridge continues the work on the effects of gamma radiation on mitosis. Temporary inhibition of mitosis is followed by compensatory increase, if the damage inflicted by radium is not too great. The effects of gamma rays on certain protozoa were investigated at the Lister Institute. Cultures of the

flagellate protozoon, *Bodo caudatus*, show a diminution of growth in the presence of radium, and there are also differences in the appearance of the survivors from the irradiated strain; these changes persist, after the removal of radium, for a number of generations, but eventually disappear. Researches on the disappearance of the lymphocytes from the peripheral circulation under the influence of radium and X rays were carried out by Mottram, who attributes the phenomenon to an accumulation of these cells in the irradiated capillaries. Another problem investigated by Mottram has a direct clinical importance. He found marked degenerative changes in the muscle of a rat when bone was present in the irradiated area. These changes were more marked in muscle close to the bone than in similar tissue which was nearer to the source of radiation but remote from the bone. This result is attributed to the action of secondary radiation given off by calcium in bone.

The possible production of a malignant tumour from a relatively small source of gamma radiation acting over a prolonged period is seen in the unique case from the Royal Free Hospital, where a needle containing 2 mgrm. of radium element, screened by 0.5 mm. of platinum, was displaced after operation for a breast cancer, penetrated the thoracic wall, and finally lodged in the heart, where it remained for about three years. At post-mortem examination, marked local changes of a necrotic nature were found in the heart muscle. Among other abnormalities, the liver was found to be enlarged and deformed. There was a large hæmorrhagic tumour in that part of the liver immediately adjacent to the radium needle, and on microscopical examination this proved to be a hæmangio-endothelioma. There were metastases in the lungs and bone-marrow. The situation of the tumour taken to be the primary growth suggested that radium, directly or indirectly, may have been responsible for it. The original site of the cancer in the breast showed dense scar tissue only, and there was no evidence of secondary deposits from a mammary cancer anywhere.

Late Effects of Radium.—Ira I. Kaplan⁹ summarizes the incidence, etiology, and medical treatment of the late effects of radium and X rays.

Skin.—Telangiectases: The usual time of appearance is after one year, but they may occur as early as four months after irradiation. They go on developing for from a few months to two years. After four or five years there is a tendency towards retrogression. In cases where they develop, N. S. Finzi¹⁰ states, the skin has never become quite normal after the primary erythema. Telangiectases are more likely to appear after severe X-ray treatment than after gamma-ray treatment. They can develop without there ever having been a burn or without erythema occurring at any time. Repeated full doses of X rays have a special tendency to produce them.

Benign and malignant neoplasms: Warts tend to form in late stages both of burns caused acutely and of chronic radiodermatitis. In the former they rarely become epitheliomatous; in the latter this tendency is greater.

Subcutaneous Tissue.—*Acute inflammation* of subcutaneous tissues: Many years ago Finzi described a condition of acute inflammation in irradiated tissues starting quite suddenly, in one case with a rigor. He has seen one subsequent case, associated with impetigo. He thinks there is no doubt that these cases are due to microbic infection, and he thinks that all cases that start as thrombosis and all late ulcers are of the same nature.

A persistent thickening of the subcutaneous tissues (solid oedema) frequently develops after large doses over the lower abdomen in stout patients. It may occur without skin change. Thickening occurs after heavy dosage, especially after infection.

Mucous Membranes.—These are liable to telangiectases and late ulceration. In the vagina adhesive vaginitis gradually supervenes a number of months

after treatment of the cervix. The vaginal mucous membrane is much more resistant than the rectal. Rectovaginal, rectovesical, and vesicovaginal fistulas occasionally occur after treatment of cervical carcinoma by radium, but not in so large a proportion as in untreated cases.

Lung.—The acute picture gives the same ultimate picture as the late X-ray effects. Inflammation before or after treatment is probable in the latter. In the late X-ray or radium effect the first event is displacement of the mediastinal contents towards the affected side. Later, the mottled appearance develops, and finally the appearance of bronchiectasis. Finzi has seen improvement, but not recovery. In an acute case, which he observed from the beginning, the first change was faint opacity as in acute pneumonia. This became denser, and was followed by collapse of part of the affected lung.

Eye.—Cataract has developed after very heavy dosage. No ill effect on the retina has been observed, but severe conjunctivitis is not uncommon.

TREATMENT.—Finzi strongly deprecates treating X-ray warts and epitheliomas by further radiation of any sort. Telangiectases can be treated by the spark from the static machine or the high-frequency resonator. This is quicker than electrolysis. He recommends a solution of **Cellulose** or **Durofix** (a preparation for mending china) for cracks in fingers and nails. Thickening of the skin and subcutaneous tissues is a contra-indication to any operative interference other than their removal. If cut into they do not heal readily. In acute inflammation, thrombosis, and the earliest stage of ulcer, treatment is complete rest of the part. Application of irritants or of hot fomentations is disastrous.

Although he has known ulcers to heal under medical treatment and remain healed many years, any tendency to continued ulceration is an indication for surgery. In cases of medium- or large-sized ulcers the following preparations are recommended: 5 per cent anesthesin in vaseline; lin. calaminæ containing phenol gr. 1 to the ounce; 5 per cent cycloform in vaseline; radiostol 1 part, liquid paraffin 3 parts. An isotonic or hypertonic solution of sodium chloride, applied no warmer than blood heat, is a good dressing. After the ulcer has cleared up, epithelial growth may be hastened by **Scarlet Red** 3 per cent in vaseline or by a similar strength of **Ortho-amido-azotoluene**.

Excision followed by **Grafting** is advised in cases of stubborn chronic radio-dermatitis due to a single exposure or set of exposures. One should always be more ready to adopt surgical measures when the damage has resulted from long-continued irradiation than in that which has followed an acute burn, owing to the much greater tendency to malignant change. Epitheliomas must be excised, preferably with the diathermy knife.

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CARBUNCLE.

Sir W. I. de C. Wheeler, F.R.C.S.I.

W. A. White and E. A. Cooney¹ advocate the non-operative treatment of carbuncles. They draw attention, in the first instance, to the danger of interfering with such conditions in the upper lip. The danger of incision into boils or carbuncles of the upper lip owing to the spread of infection has been emphasized by many writers. These infections are serious on account of the anastomosis of the superior ophthalmic vein with the facial at the root of the nose. Thrombophlebitis reaches the cavernous sinus through this channel (Wheeler²).

The more usual non-operative treatments consist of: (1) Specific and autogenous vaccine; (2) Circuminjection of autogenous blood; (3) X-ray therapy. So many treatments are described that it would seem that carbuncle runs a natural course and would probably get well with little or no treatment.

White and Cooney, after a wide experience, recommend **Non-specific Protein Therapy** without operation. Daily injections of **Aolan**,* 10 c.c. intragluteally, were given with success. There is no local treatment except dry gauze dressing. Aolan is made in commercial ampoules and is a non-specific protein. Two other preparations are mentioned—**Omnadin**† and **Activin**. Omnadin is a combination of proteins, lipoids, and fats, and activin a purified 5 per cent casein in combination with organic iodine. Treatments are intramuscular into the gluteal or deltoid regions, and the average number of injections is about four.

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CATARACT.

Sir Stewart Duke-Elder, M.D., F.R.C.S.

In these days when newer and more complicated procedures are being devised and advocated for the operative technique of the extraction of cataract, all of them introducing more manipulative difficulties at the time of the operation, most of them more dangerous afterwards, and none producing results better than the classical extracapsular method, it is useful to study a very sane review by M. H. Whiting¹ of the newer developments in the well-tried operation which have been introduced of recent years.

Pre-operative Preparation.—One of the most important pre-operative requirements is a *preliminary bacteriological examination of the conjunctival sac*. The bacteriological examination is carried out at least forty-eight hours before the operation, so as to allow time for the growth of the pneumococcus on the culture medium. The examination is a simple one—a swab-stick armed with dry cotton-wool is placed in the lower conjunctival fornix and gently rotated there, and the secretion so obtained is rubbed over the surface of a blood-agar slope. Incubation for forty-eight hours is then carried out, and the presence of any organisms other than *Staphylococcus albus* and *B. æerosis* on the medium is a bar to operation. This may be taken as the general rule of most operators; some, however, do not object to the presence of such organisms as the *Micrococcus catarrhalis* and the pneumo-bacillus; but these are best regarded as dangerous, and even a profuse growth of *Sta. albus* as not being devoid of risk. The only exception to the rule is in cases where the growth is limited to one or two colonies of *Sta. aureus*. This may be the result of an accidental contamination, and in any case indicates that there is only a very attenuated infection. In such cases, it is well to take the precaution of putting 10 per cent **Protargol** in the conjunctival sac ten minutes before the operation is commenced. It must be remembered that infection of the eye in an operation of the extent of a cataract extraction is an extremely serious and generally fatal complication to the eye. It is probable that intra-ocular infection is much more likely to be fatal than intra-abdominal infection so far as the ultimate success of the operation is concerned. There is no possibility of drainage of the infected area, and even a slight degree of intra-ocular suppuration causes destruction of the eye as a seeing organ even if the eye itself escapes removal. Before bacteriological examination of the conjunctival sac was adopted, the cases of suppuration owing to infection at the

*Beiersdorf Ltd., Welwyn Garden City, Herts.

†Bayer Products Ltd., Africa House, Kingsway, London, W.C.2.

time of the operation amounted to between 1 and 2 per cent at Moorfields. To-day the almost complete freedom from suppuration is due entirely to the invariable rule that a forty-eight hours' culture be made, and that the result of this culture be adhered to. The fact that a dirty culture is obtained does not mean that the operation cannot be done, but merely that it is postponed. In such cases the conjunctival sac is treated for a period with various lotions and drops of an antiseptic character. Antiseptic treatment is then discontinued for at least a week, and a second culture is taken. If this is satisfactory, the operation may be done. If the culture is still dirty, further treatment is undertaken until at last a satisfactory condition of the conjunctival sac as indicated by culture is obtained. It is rarely necessary to postpone the operation for a longer period than four or five weeks. It should be noted, of course, that in taking the culture care must be exercised to avoid touching the skin surface, which is generally to a certain extent contaminated with *St. aureus*.

The second point in pre-operative preparation is the careful *medical treatment of cases in which the cataract is associated with diabetes*. In some of these cases the cataract is the direct result of the diabetes; in others the cataract may be an ordinary senile one occurring in a diabetic patient; but in either case careful medical treatment exercises a profound effect on the course of the case after the operation.

It is very important to secure *paralysis of the orbicularis muscle* during the operation. Since cataract extraction is almost invariably done under local anæsthesia, it is natural that without some such precaution involuntary contraction of the orbicularis may often occur, and damage from this cause may happen, not only at the operation but during a period of several hours after. There are three methods by which it can be done:—

The first one is by injection with novocain of the orbicularis itself from a point opposite the outer angle of the orbit. This also produces anæsthesia of the lids themselves, but has the disadvantage of causing swelling, which may hamper the surgeon during the course of the operation.

The second method is to inject round the facial nerve in the vicinity of the stylomastoid foramen. This is somewhat more difficult, but when effective produces a complete paralysis of the facial nerve, including the lower branches. This is unnecessarily extensive, and also some quite definite dangers attach to the method.

The third method is to inject round the upper branches of the facial nerve, placing this injection just in front of the lower part of the ear; the exact spot is ascertained by feeling for the temporo-maxillary joint as the patient opens and shuts his mouth and then pushing the needle right down to the surface of the jaw just below this until the point touches the bone. The injection is then made, about 2 c.c. of 4 per cent novocain being used. The result may be made more certain by injecting some of the novocain solution along the lower border of the zygoma. Paralysis of the orbicularis ensues in about five minutes. This method is by far the best, as it is easy, and complete paralysis is obtained without any troublesome swelling of the lids. It is usually necessary to insert a suture through the skin of the upper eyelid near its margin, so that the upper lid may be pulled down over the eye after the operation has been completed.

If the operator considers it essential that no sensation should be felt during the iridectomy, this result may be attained with a fairly constant degree of success by an injection of a small quantity of novocain beneath Tenon's capsule. *Anæsthesia of the iris* in the upper part where the injection is made is usually complete in about five minutes. The only disadvantage of this method is that it may sometimes cause some chemosis of the conjunctiva in this region.

A further point in pre-operative technique, which is used as routine by some surgeons, but which may be unnecessary except in a refractory or very nervous patient, is the *fixation of the eye* with a suture in the superior rectus in order to pull the eye down. It is important in cases with patients who are mentally unstable and in whom the eye cannot possibly be retained in the proper position without such assistance, but is an unnecessary complication in the ordinary case.

Operative Technique.—The section which has now been almost universally adopted in the extraction of cataract is one which involves the limbus over an extent varying between $\frac{1}{3}$ and $\frac{1}{2}$, and which is almost invariably placed in the upper half of the globe. It is now usual to make this so that the upper part of the section emerges rather above the limbus, making a small scleral flap and a rather large conjunctival flap. After the operation is completed the conjunctival flap quickly becomes adherent and makes a firm junction which will resist a reasonable amount of pressure from within. There is no doubt that the fashioning of this conjunctival flap has an important effect in preventing the tendency to prolapse of the iris and, later, infection of the wound. Several variations of this flap have been devised. One is to make the section with a conjunctival bridge, i.e., the cutting out of the flap is not completed, and when the lens is expressed it is made to escape at one side or other of the section. This is not a new method, as it was originally used nearly forty years ago, but it has recently been resurrected and has some vigorous advocates. Such a conjunctival bridge has no real advantages, for it hampers the surgeon in the subsequent stages of the operation, and in the event of an iris prolapse after the operation the necessary iridectomy is thereby made much more difficult. If it is desired to secure the flap by other means than natural adhesion, a suture may be placed through the apex of the flap and the conjunctiva above, and this suture can be tied at the completion of the operation. This is a useful procedure in certain cases, but it must be definitely noted that a suture confined purely to the conjunctiva cannot prevent the escape of vitreous. The conjunctiva is so lax that opening of the wound to a considerable extent is still quite possible after the conjunctival flap has been sutured, and so this measure does not prevent vitreous escape at the operation, or a subsequent reopening of the wound. Where, because of the presence of a fluid vitreous, it is thought that vitreous prolapse during the operation is likely, some surgeons have adopted a suture which unites the upper corneal margin with the sclera above, and this is particularly favoured by those who adopt the intracapsular method.

The *iridectomy* should not be performed until the lens has been expressed. This applies only to extracapsular extractions, for the objection in this operation to an early iridectomy is that in the process of expression of the lens the torn anterior capsule is pushed up into the wound. If the iris is intact, the process of replacing the iris automatically replaces the capsule at the same time, but if an iridectomy has been performed before the lens is expressed, the practically invisible capsule is in the wound, and its replacement is difficult and is very likely to be incomplete. It is established that the entanglement of lens capsule in a cataract extraction wound is a common cause of post-operative inflammation and may even lead to sympathetic iridocyclitis, the most disastrous condition which can result from any intra-ocular operation. For the same reason preliminary iridectomy—that is, iridectomy performed some weeks before the extraction of the cataract—should be avoided if it is humanly possible.

In extracapsular extraction, after the section has been made it is necessary to open the anterior layer of the capsule in order to permit expression of the

lens. There are various ways in which this may be done. Some surgeons depress the point of the knife as they are making the section and slit up the capsule in this way. This demands a slight additional dexterity in making the section, but it does away with the introduction of a second instrument after the section has been made, a process which is liable to dangers of its own.

The second method is to use a cystitome after the section has been completed. This is not always easy; it is quite possible for the cystitome to become entangled with the iris and so cause a complication in the operation.

The third method is to introduce capsule forceps and grip a portion of the capsule and remove this portion from the centre of the pupillary area. Whiting regards capsule forceps used in this way as being definitely dangerous; he has on one occasion seen a complete irido-dialysis effected through a portion of the iris being gripped and the patient then suddenly moving his eye. It is claimed by those who use capsule forceps that the removal of a portion of the capsule makes subsequent needling much less likely to be necessary. It is a question whether the dangers of the method do not far outweigh the disadvantages of having to perform a needling, which is, after all, a simple operation attended by practically no disadvantages or risks.

When the lens has been expressed from the capsule it frequently happens that a certain amount of the soft cortex remains behind. This is particularly likely to be the case in immature cataracts in relatively young patients. Generally the greater part if not all of this *soft lens matter can be removed by careful lavage* with normal saline solution. The most convenient method of doing this is to have an undine with about two feet of rubber tubing attached to the spout, and at the end of the tubing a small nozzle with a flattened aperture. The assistant holds this undine at a varying height according to the requirements of the surgeon. The latter introduces the nozzle inside the wound and gently irrigates until the cortical remains have been washed out of the lens capsule and the anterior chamber. This is quite a simple procedure, and since by these means an immature cataract can be removed completely, or nearly completely, the objection to extracapsular extraction for immature cataracts disappears.

In doing the final capsulotomy, when dividing the capsule surgeons used to pass the needle through the cornea and then through the capsule often to a depth of several millimetres below the surface of the membrane; vigorous movements in a crucial direction divided the capsule in a more than adequate manner, but the vitreous was extensively ploughed up and the ciliary body was forcibly pulled upon. The result of this was to cause a free passage of vitreous into the anterior chamber with glaucoma as a not uncommon sequel, while the damage done to the ciliary body frequently led to a serious iridocyclitis.

The modern procedure is to use a needle with either a straight or a curved cutting edge. The needle is introduced at the limbus, and the capsule is just pierced with the point. The point is then made to travel a short distance only just beneath the capsule and to emerge again on its anterior surface. In this way a linear cut in the capsule is made which often will open sufficiently for the purpose; but if the opening is not sufficient, a second cut is made vertically either above or below, thus producing a T-shaped incision, or sometimes a crucial incision. If the opening is central, it is sufficient for it to be about the size of an ordinary small pupil. When the operation of capsulotomy is performed in this way it is the rarest possible occurrence for any serious results to follow.

Removal of Lens by Diathermy.—A completely new idea in the technique of cataract extraction has been advocated by J. L. Lacarrere²—namely, the

removal of the lens by diathermy. A high-frequency coagulating current is used. The instrument elaborated by Lacarrere—the electrodiaphake—is essentially a pencil-like holder ending in a fine-bore glass tube into which are led two steel wires 0.14 mm. in diameter, which can be made to project beyond the glass tube, forming a bifid extremity to it. After the usual incision they are introduced into the anterior chamber and placed against the lens and the current turned on. The anterior capsule is perforated and the lens coagulated so that it remains firmly attached to the instrument. No pressure need be exerted, since the diathermy current opens up a way for the steel terminals through the lens tissue, which coagulates around them like white of egg. The strength of the adhesion assessed as lifting weight capacity when coagulation has occurred has been measured as 70 grm., the same lens when grasped by capsule forceps showing a lifting capacity of only 5 grm. At the same time the coagulation diminishes the volume of the lens, so that the shrunken mass firmly adhering to the instrument can be manœuvred out of the eye. The operation would seem to be particularly applicable to the extraction of a dislocated lens; and Lacarrere reports 7 successful cases in his first 10 attempts. It is too early yet, however, to give an authoritative opinion on the method; and it would seem advisable that more experimental work should be done first upon the possible deleterious effects of diathermy currents on the eye before it is generally practised.

REFERENCES.—¹*Irish Jour. Med. Sci.* 1933, March, 111; ²*Rev. cubana de Oto-neuro-oftal.* 1932, i, 149.

CATHETERIZATION OF THE URETHRA. *Hamilton Bailey, F.R.C.S.*

An extreme instance of a long catheter life is recorded by F. A. Brodribb.¹ His patient, a parson, died at the age of 74. For fifty-four years he had catheterized himself. Now and then the reverend gentleman used a lubricant for his catheter—sometimes he spat upon it. Such cases are exceptional, and death directly due to unsterile catheterization is still frequent. In these days, remarks A. E. Roche,² one should not see the practitioner pass a catheter just taken from his pocket and rinsed in weak lysol. Unsterile catheterization in acute retention is still the captain of the causative agents of pyelonephritis (H. Bailey³). It should be more widely appreciated that modern *gum elastic catheters* are boilable, and with due care they withstand repeated boiling. The catheter should be plunged into water already boiling for two minutes. It must be removed by its wide end carefully from the boiling water, and dropped into sterile cold water or cold weak antiseptic lotion before use. "I never touch any portion of the catheter that enters the patient's urethra", writes J. Swift Joly,⁴ "so always lift it out of the lotion by its proximal end". A few drops of an antiseptic lubricant are allowed to fall on its tip. The penis is kept stretched vertically while the instrument is passed.

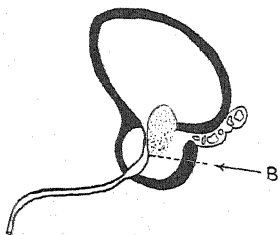


Fig. 30.—Where the middle lobe of the prostate begins. The point B at which pressure by a finger in the rectum sometimes helps to lever a catheter into the bladder. (After T. E. Hammond.)

In discussing the catheterization of prostatic cases, T. E. Hammond⁵ emphasizes the value of the bicoudé gum-elastic instrument. In urinary obstruction due to an enlarged prostate there is no actual narrowing of the urethra. Difficult catheterization is rather the result of irregular urethral contour. The most difficult point to pass is where the middle lobe commences (Fig. 30), i.e., about half-way down

the prostatic urethra. The double bend of the bicoudé instrument helps to surmount this obstacle. At times the left index finger in the rectum may help to lever the tip of a catheter into the bladder. It should be noted that pressure must be exerted not too far from the anal verge but over the point B in *Fig. 30*, which is where the middle lobe begins.

T. Millin⁶ finds that a satisfactory self-retaining catheter can be improvised as follows. A pliable coude gum-elastic catheter (*Fig. 31*) is threaded with a long piece of silk by means of a stout cutting needle. At *a* the catheter is pierced with the loaded needle; one end of the silk is knotted and the knot drawn within the lumen. A hole (*b*) is cut about $2\frac{1}{2}$ in. from the closed end of the catheter, and the free end of the silk drawn through this and down the lumen by means of a stylet. It is again threaded on to the needle and passed through the wall of the catheter at *c*. After introduction into the bladder by pulling on the silk the catheter curves itself, as shown, the position being maintained by means of a knot at *c*. This method of improvising a self-retaining catheter was described in America last year by H. F. Ullrich.⁷

The simple and extremely satisfactory piece of apparatus for retaining a catheter in the urethra

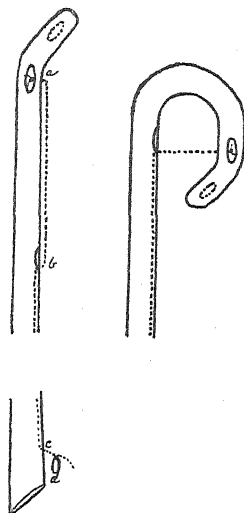


Fig. 31.—Self-retaining catheter. See text. (By kind permission of the 'British Medical Journal'.)

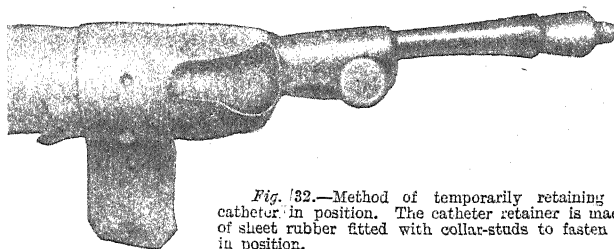


Fig. 32.—Method of temporarily retaining a catheter in position. The catheter retainer is made of sheet rubber fitted with collar-studs to fasten it in position.

shown in *Fig. 32*, and made by the Genito-Urinary Manufacturing Co., deserves to be better known.

REFERENCES.—¹*Brit. Med. Jour.* 1932, ii, 78; ²*Clinical Jour.* 1933, Feb.; ³*Practitioner*, 1933, March, 342; ⁴*Post-graduate Med. Jour.* 1932, March, 77; ⁵*Practitioner*, 1932, June, 592; ⁶*Brit. Med. Jour.* 1932, ii, 675; ⁷*Jour. of Urol.* 1932, July, 123.

CENTRAL NERVOUS SYSTEM, TREATMENT OF INFECTIONS OF.

(See also MENINGITIS.)

Macdonald Critchley, M.D., F.R.C.P.

The Use of Hexamine.—Since the observations of S. J. Crowe¹ as to the demonstrability of hexamine in the cerebrospinal fluid following oral ingestion, it has been customary to prescribe this drug in various inflammatory disorders of the brain and meninges. Despite its wide employment, it is doubtful whether much enthusiasm has ever been raised over its therapeutic efficacy, and from time to time scepticism has been expressed about its antiseptic power and even about its actual passage into the spinal fluid.

W. Summers² has made a careful and important research with a view to determining the antiseptic power of hexamine in infections of the nervous system and meninges. The original conclusions of Crowe, made in 1909, may first be recalled. He decided that: (1) The largest amounts of hexamine are found to be present in the cerebrospinal fluid from thirty minutes to one hour after its ingestion; (2) After therapeutic doses of the drug a sufficient quantity appears in the cerebrospinal fluid to exercise a marked inhibition of the growth of organisms inoculated into this fluid after its removal from the body; (3) Hexamine given to dogs and rabbits in doses of 60 to 80 gr. the day before—and in some cases after—subdural inoculation with streptococci will defer or prevent the onset of fatal meningitis; (4) In view of these observations, the prompt administration of urotropine is advised in all clinical cases in which meningitis is a possible or threatened complication, or even where meningeal infection has actually occurred. The same year H. N. Rowell³ recorded a case of meningitis in a child of 19 months who recovered rapidly after the administration of 1 gr. of hexamine every four hours. Further reports followed on its effect in various neurological affections, including poliomyelitis, as well as on its prophylactic value in cases of fractured skull, operations for pituitary tumour, and cerebrospinal fistulae.

Following Nicolaier, it is usually taught that the antiseptic action of hexamine in urine is due to the formaldehyde liberated by decomposition. Others, however, believe that hexamine itself possesses antiseptic powers. The difficulty lies in the fact that the chemical tests employed in the detection of the drug in body-fluids were mainly such as would not distinguish between hexamine and formaldehyde; or, where a discriminating test was used, it was inapplicable to albuminous body-fluids, including the cerebrospinal fluid. In 1912 C. F. Burnam⁴ concluded that hexamine was useless as an antiseptic for the cerebrospinal fluid, but that it was very effective in acid urine, presumably owing to the liberation of formaldehyde in an acid medium. F. Hinman⁵ in 1914 confirmed this view by finding that hexamine was not converted into formaldehyde in any of the alkaline body-fluids, including the cerebrospinal fluid. Even when an alteration in the pH may occur, as in some infective disorders of the nervous system, there was an insufficient shift towards acidity to permit of the liberation of adequate amounts of formaldehyde. The conclusion was that the therapeutic use of hexamine was justifiable for urinary infections only. As late as 1924 F. de Eds⁶ concluded that there is no rational basis for the use of hexamine, orally or intravenously, as a systemic antiseptic in the treatment of various infectious diseases and localized infections.

From a series of chemical and biochemical studies, the conclusions of W. Summers may be given in full:—

1. The dissociation of hexamine resulting in the liberation of formaldehyde is dependent upon various factors, namely: (a) Concentration of hexamine in solution; (b) Temperature of the solution; (c) Hydrogen-ion concentration of the solution; (d) Time allowed.

2. Dissociation of hexamine *does* occur in alkaline solutions.

3. Presence of excess of protein probably hinders the dissociation of hexamine.

4. Employing the most satisfactory tests and using the fullest possible degree of control, it is found that hexamine appears in the cerebrospinal fluid within fifteen to thirty minutes after the administration of the drug to the patient.

5. No detectable quantity of formaldehyde appears in the cerebrospinal fluid as a result of the administration of hexamine.

6. In the nature of the case it is improbable that formaldehyde, if it were ever formed in the cerebrospinal fluid, would continue to exist as such; accumulation to the degree necessary for antiseptic action is highly improbable.

7. Hexamine itself has no bactericidal action; this action depends upon the liberation of formaldehyde.

8. In cases of infection of the central nervous system no antiseptic action is to be expected from the administration of hexamine to the patient orally or intravenously.

Forced Spinal Drainage.—For the past four or five years Kubie's method of treating infective and septic infections of the nervous system by means of forced spinal drainage has become increasingly popular. The chief morbid conditions in which this form of treatment is said to be indicated are those characterized by a perivascular cellular infiltration (epidemic encephalitis, poliomyelitis, neurosyphilis). Septic and tuberculous varieties of meningitis have also been treated in this way, and enthusiasts have even carried out this technique in cases of rheumatic chorea.

L. Kubie⁷ in 1928 showed that the intravenous injection of hypotonic salt solution produces in animals marked increase in intracranial pressure and great hydration of the central nervous system. If, however, a needle is introduced into the subarachnoid space and allowed to remain *in situ*, the increased amount of fluid drains off, and there results neither increase of intracranial pressure nor hydration. The suggested explanation is that the osmotic pressure of the blood falls and thus causes a transudation of fluid from the capillaries, through the intercellular tissues, into the perivascular lymph spaces, and so to the subarachnoid space. In this way, according to Kubie, a washing-out of the perivascular exudate into the subarachnoid space was achieved in experimental states of meningo-encephalitis in cats.

According to G. M. Retan,⁸ who has carried out this procedure in patients suffering from various neuro-infective disorders, this lavage is demonstrable by an increase in the cell-count and the amount of protein in the lumbar fluid. This author believes also that forced spinal drainage relieves the local oedema of the nervous system in infective states. The technique consists in the intravenous injection of at least 1000 c.c. of a 0.45 per cent solution of NaCl, over the course of one hour. In the more severe cases this may be repeated. After the injection physiological solutions of saline may also if desired be given by mouth. Immediately before the intravenous injection a lumbar puncture is made and the needle left in position. It is essential that spinal fluid should drip from the needle during the injection of the hypotonic saline and for at least an hour afterwards. If for any reason fluid should cease to escape from the needle, the intravenous injection must be stopped until drainage becomes re-established. Should the patient complain of headache during the operation, the stylet may be introduced into the needle for ten or fifteen minutes. Vomiting occasionally occurs, but is not regarded as an indication to interrupt the drainage. Retan reports 21 cases of various disorders treated by forced spinal drainage; recovery was claimed in 2 cases of pre-paralytic poliomyelitis; 2 of acute epidemic encephalitis; and 1 case each of Sydenham's chorea, syphilitic meningo-hydrocephalus, and tuberculous meningitis (the last was not verified by the finding of tubercle bacilli in the spinal fluid).

F. Fremont-Smith, T. J. Putnam, and S. Cobb⁹ have treated a series of 11 cases of disseminated sclerosis by this means, without, however, specifically noting the clinical effects. (Their technique also includes the injection of 0.5 c.c. of pitressin with a view to delaying diuresis.) R. G. Spurling¹⁰ reported 8 cases treated by spinal drainage through an open lumbar laminectomy—

1 patient with poliomyelitis of six days' duration recovered, 3 out of four patients with septic meningitis, and 1 of two patients with cerebral abscess. V. Casten¹¹ has recorded one case of blindness following tryparsamide medication treated successfully with forced spinal drainage.

REFERENCES.—¹*Bull. Johns Hopkins Hosp.* 1909, April, 20; ²*Birm. Med. Rev.* 1933, June, 76; ³*Jour. Amer. Med. Assoc.* 1909, Nov. 13, 1641; ⁴*Arch. of Internal Med.* 1912, x, 324; ⁵*Ibid.* 1914, xiii, 841; ⁶*Ibid.* 1924, xxxiv, 511; ⁷*Brain*, 1928, li, 244; ⁸*Jour. Amer. Med. Assoc.* 1932, Sept. 3, 826; ⁹*Arch. of Neurol. and Psychiat.* 1930, xxiii, 219; ¹⁰*Kentucky Med. Jour.* 1928, xxvi, 242; ¹¹*New Eng. Jour. Med.* 1930, April 3, 676.

CEREBRAL ABSCESS. (See BRAIN, ABSCESS OF.)

CEREBRAL HÆMORRHAGE. (See APOPLEXY, CEREBRAL.)

CEREBRAL TUMOURS.

Geoffrey Jefferson, M.S., F.R.C.S.

Meningiomas.—A very compressed paper by H. Olivecrona,¹ of Stockholm, on the treatment of the parasagittal meningiomas is an important one for surgeons. This paper is, we understand, to be elaborated into book form. The chief points that Olivecrona makes are set out below.

He found meningiomas to represent 14 per cent of all histologically examined tumours, a percentage which has remained fairly constant for years, and accords with other statistics. Those in the parasagittal situation are by far the most frequent. By that is meant that the tumours have arisen from the longitudinal sinus or from the meninges immediately external to it.

SITE OF OLIVECRONA'S MENINGIOMAS.

Parasagittal	22
Convexity of hemisphere ..	7
Fissure of Sylvius	6
Suprasellar	5
Olfactory groove	1
Gasserian ganglion	2
Lateral ventricle	2
Cerebello-pontine angle ..	5
Varia	3

53 out of 371 histologically
verified intracranial
tumours (14 per cent)

From the point of view of symptoms, the exact site is of little importance, as it does not matter greatly if the tumour is a few millimetres outside the sinus; but from the viewpoint of operative technique it is very important, for it is the most difficult of surgical operations to separate the tumour from the sinus, whilst this difficulty is not present in those a little removed from the mid-line. We must remember that pathologically there are variations in meningiomas; some tend to be malignant and to give rise to recurrence. The great proportion of them, however, are not malignant and do not recur if they are completely removed. The parasagittal meningiomas, owing to their slow growth (as with meningiomas in general), often reach a large size before coming to operation. In the majority of the author's cases the size was from a goose's egg to an apple. Smaller tumours (hen's egg) are sometimes found when they cause motor symptoms. Meningiomas as a rule are very vascular, and this adds to the difficulty of operation. On opening the dura they may not be visible and the surgeon may have to dissect down upon them. The connection of the growth to the sagittal sinus varies; in the majority of cases the tumour reaches the margin of the sinus or bulges into it. Again, the sinus may be completely filled with tumour, which may come through on the other side.

This occurred 4 times in 22 examples. Vessels come partly from the dura but mostly from the pia, and cross the space between pia and tumour, where they can be caught and coagulated.

With regard to the position of the tumour we can distinguish (1) an anterior, (2) a middle, and (3) a posterior syndrome. Usually these syndromes with the X-ray appearances are sufficient for a clear diagnosis.

1. *The anterior syndrome* is comparatively poorly defined, and without a positive X-ray can only be tentatively recognized when the following symptoms are present: (a) Double papillædema with very definite defect of vision on the side of the tumour; (b) Psychic disturbance—if very pronounced, indicates a very large or double-sided tumour. Other less constant symptoms may be present: homolateral anosmia, a slight contralateral facial paresis, or disturbance of micturition. The anterior parasagittal syndrome resembles the subfrontal syndrome of Foster Kennedy, but is less typical.

2. *The middle syndrome* is the motor and sensory one. The classical monoplegia of the leg is not, however, always found; the paresis may begin in the arm.

3. *The posterior syndrome* consists of contralateral homonymous hemianopia with sensory disturbance (and, if left-sided, alexia and aphasia).

The proportions of the cases comprising these three syndromes were 8-11-3, of which 5-11-2 showed more or less typical signs, the others being indefinite. Radiologically these tumours are difficult, for the variations in bone and vessel formation along the sagittal suture make the diagnosis perplexing. But the combination of the clinical picture and X-ray findings is often quite definite; if not, recourse may be had to ventriculography. Originally Olivecrona only made ventriculograms when the site of the tumour was uncertain, but he has found the picture obtained to be characteristically useful, so it is now taken even when the site of the tumour is known. In the malignant hemispherical gliomas the ventricle is very much more widened than in the meningiomas, and the ventricular deformity is less marked.

TREATMENT.—As to the operative technique, he insists on the necessity for uncovering the sagittal sinus for at least 10 cm. and for 2 to 3 cm. across the middle line. Hemorrhage may be severe on reflecting the bone, and therefore the dura is immediately covered with a thin sheet of wet cotton, which is left *in situ* and cut through together with the dura. The extent of the tumour can now be seen and the dura of the opposite side opened to look for a dumb-bell tumour. The most important step now follows—the separation of the tumour from the sinus by cutting through the dura between the tumour and the sinus, securing the edges with silver clips. Olivecrona has usually opened the sinus in one or more places, and occasionally resected part of it, but only as a last resort in the Rolandic region or behind it. A large piece of dura is always removed with the tumour. This is not repaired, but the bone-flap at once replaced with a twenty-four hour drain. He strongly favours one-stage operations with transfusions. In his first 11 cases he had 7 cases with two or more stages, in the later series only one.

The *after-care* of these cases is difficult; frequent punctures are necessary to reduce pressure, and there is a strong tendency to fistula formation from the excessive production of cerebrospinal fluid. This is an important argument in favour of the one-stage operation, for the wounds of two-stage interventions never heal so well. Olivecrona's mortality is 13·6 per cent—3 deaths in 22 cases; he lost his second, third, and tenth case. The cause of death in the first case was post-operative fistula with meningitis; the second case died several months later, the third three years later, of recurrence.

On meningiomas other than the parasagittal there are two recent papers of

note. In one C. A. Elsberg² is concerned with those occupying the floor of the middle fossa beneath the right or left temporal lobes. He considers that the symptomatology is fairly characteristic: his patients have had attacks of unconsciousness or generalized convulsions for several years, and then commence with headaches and perhaps personality changes, accompanied by pale discs or papilloedema. X-ray examination reveals erosion of the floor of the sella and atrophy of the clinoid processes. Elsberg has found tumours in the situation mentioned in 15 (or 14.7 per cent) of his total of 102 meningiomas. In the second paper, which will only be mentioned, C. H. Frazier³ describes a series of cases of unilateral exophthalmos. Of 15 such cases meningioma was the cause in 10, usually in the middle fossa. The causes in the remaining 5 cases were: orbito-ethmoidal osteoma 2, epidermoid (cholesteatoma) 1, Paget's disease 1, adenocarcinoma of scalp and skull 1. This is an important and well-illustrated communication and will repay close study by those who have the care of similar cases.

Gliomas of the Cerebral Hemispheres.—It is now a well-established fact that the cerebral gliomas do not produce the same effects in all patients. Not only are there several different kinds of glioma histologically, but definite tumour syndromes have been worked out, based on the predilection of certain types of growth for certain situations.

A rough classification can also be made on the grounds of the rapidity of the evolution of symptoms. The classification of gliomas into acute and chronic is a step of very considerable practical importance, for the acute types as a rule are unpromising and indeed usually hopeless problems surgically, nor do they do well with radiotherapy. The patients stand operation badly and are little or not at all profited by it. It becomes important therefore to recognize the acute or malignant class. In a review of his gliomas H. Olivecrona⁴ found 118 in the cerebrum and 63 in the cerebellum or pons (roughly 2 to 1 above and below the tentorium). The tumours in the hemispheres were chiefly near the motor area and especially about the Sylvian fissure. From their clinical course he divided them into malignant and benign gliomas, and these occur with about equal frequency. The malignant cases usually attack persons between the ages of 40 and 60, with either an insidious or apoplectic onset. The essential point is that pressure signs are usually slight, papilloedema being often absent, whilst intellectual and behavioural changes are marked. The survival period is from six to eight months. By contrast the benign group is found chiefly in young persons, the clinical history is longer, and pressure signs are present, often in high degree. Mental changes occur late. Olivecrona thinks that the malignant gliomas tend to cause dilatation of the contralateral ventricle and usually of the non-obiterated part of that of the same side. The benign cases do not cause such marked obliteration of the ventricles as do meningiomas, nor so much dilatation as do the malignant tumours, unless the history is very long. These points are well brought out by ventriculography. Nothing can be done for the malignant cases, for even if an operation is performed to relieve distressing headache and vomiting, the patient never has a period when he can work again before death supervenes. If operated upon, Olivecrona thinks they do much better with tumour removals than with plain decompression (post-operative mortality: decompression 52.5 per cent, tumour removal 23 per cent). With the benign tumours it is even more important to remove the tumour radically, for in them a period at least of working capacity is to be expected, and 25 per cent of his cases lived for two years or longer.

REFERENCES.—¹*Zentralbl. f. Chir.* 1932, Dec., 2954; ²*Bull. N.Y. Neurol. Inst.* 1932, ii, 95; ³*Surg. Gynecol. and Obst.* 1932, Dec. 1, 681; ⁴*Deut. Zeits. f. Nervenheilk.* 1932, cxxviii, 1.

CEREBROSPINAL FEVER.*J. D. Rolleston, M.D., F.R.C.P.*

EPIDEMIOLOGY.—Sir George Buchanan¹ gives the following account of the incidence of cerebrospinal fever in England and Wales during the last ten years, with special reference to the period 1929–32. In normal inter-epidemic periods, such as 1922–8, the mild cases are rarely diagnosed and notified, so that the notified cases are almost exclusively fatal. On the other hand, when a local outbreak occurs, as in 1930–2 in some English counties, the practitioners soon recognize the early symptoms and a large number recover either spontaneously or under treatment. The increased incidence of the disease is best shown by the increase in the fatality rate since 1929, when the number of deaths notified (588) exceeded that noted in England since 1915. The highest rise was found in the West Riding in Yorkshire, where 885 of the 2157 notified in 1931 occurred. Although there was an increase of influenza in 1930–2, the regions with an increased incidence of cerebrospinal fever did not show a special or simultaneous increase of influenza.

In an address on the outbreak of cerebrospinal fever in the West Riding of Yorkshire during the last three years, E. A. Underwood² states that although the county boroughs were not affected until 1931, cases began to arise in epidemic proportions in rural districts in the previous year. In 1931 cases appeared in the towns of Barnsley, Rotherham, and Conisbrough, as well as in the rural districts. In 1932 the incidence of the disease remained almost as high as in 1931. Many towns and areas which seemed to be similar as regards the industrial and social conditions were very differently affected, although in close contiguity with one another. This was due to the fact that the disease was most prevalent in places where the ratio of children under 14 was highest, as in the rapidly growing areas of Doncaster, Maltby, and Thorne. Underwood suggests that children act as reservoirs for the meningococcus, and that its virulence is raised by passage through them until meningitis is ultimately produced in a susceptible individual.

According to A. G. Hussein,³ during the years 1930, 1931, and 1932 the incidence of cerebrospinal fever in Cairo was highest between the middle of February and the middle of April. The epidemic of 1931–2 reached its peak five weeks sooner than that of 1930–1. The disease was most prevalent in children up to the age of 15 years and was rare over 35. The highest mortality was in the first year of life. There were no fatal cases over 75. The morbidity and fatality were higher up to the age of 35, while the proportion of females attacked was slightly higher above that age. Although all religious bodies and nationalities were attacked, the incidence and fatality were highest among the Jews. It was unusual to find more than one case in a house. Out of 964 cases there were only 26 in which two cases occurred in the same house and 2 in which there were three.

W. Chodzko⁴ reports that during the period 1919–July 1, 1932, the number of cases of cerebrospinal fever notified in Poland ranged from 330 in 1919 to 869 in 1929, and the case fatality from 25.4 per cent in 1932 to 61.8 per cent in 1924. These figures are almost identical with those returned for Sweden and Prussia. As in other countries, the maximum number of cases was observed in March, April, and May, and the fewest in October, November, and December. The central departments were most heavily affected.

SYMPTOMS AND COMPLICATIONS.—W. C. Cook, R. A. Lyon, and A. G. Mitchell⁵ state that of 87 cases of meningococcus meningitis admitted to the Cincinnati General Hospital during 1930 and 1931, only 36 survived in spite of vigorous treatment with anti-meningococcus serum: 26 recovered entirely, while 10 whose ages ranged from 10 months to 29 years had various *nervous complications*. Vigorous lumbar and cisternal punctures apparently had nothing to do

with the production of these complications, with the possible exception of the occurrence of radiculitis in one case.

M. Schulman⁶ reports a case in a boy, aged 6 years, of abortive meningococcus meningitis followed three weeks later by *tuberculous meningitis*. Death took place within a month. An attack of measles which occurred three weeks before the meningococcus meningitis appears to have activated a dormant tuberculous infection.

TREATMENT.—Chodzko⁴ illustrates the importance of early **Serum Treatment** by the fact that the fatality of cases so treated in the first week was 18.5 per cent, as compared with 27.5 per cent in the second week, 47.5 per cent in the third week, and 61.5 per cent in the fourth week.

REFERENCES.—¹*Bull. Off. internat. d'Hyg. publ.* 1932, 1098; ²*Public Health*, 1933, xlvii, 182; ³*Bull. Off. internat. d'Hyg. publ.* 1933, 270; ⁴*Ibid.* 243; ⁵*Arch. of Pediat.* 1932, Dec., 807; ⁶*Med. Jour. and Record*, 1933, cxxxvii, 8.

CHANCROID.

Col. L. W. Harrison, D.S.O.

DIAGNOSIS.—P. Fernet,¹ in a paper on extra-genital soft chancre, mentions a valuable diagnostic sign which was described by Professor Petgès before the dermatological section at Strasbourg in 1928. Petgès showed that besides the outer red areola there is an inner yellowish-grey one. The floor of the ulcer is sprinkled with little red, cup-like points visible under a lens. It is easy to discover Ducrey's bacillus in these chancroids if the material is taken from the red border, which is not masked by pus and necrosed particles.

TREATMENT.—H. Marchand² mentions that as long ago as 1922 he recommended the application of a 3 per cent solution of **Novarsenobenzol** to chancroids, and in 1930, Louste Thibaut and Racine confirmed this suggestion, stating that novarsenobenzol has shown itself far superior to chemical caustics such as nitrate of silver, chloride of zinc, and so forth. Marchand says, however, that novarsenobenzol sometimes fails, and some cases also are absolutely resistant to intravenous injection of **Dmelcos**. In these cases he suggests that possibly the application of either **Horse Serum** or **Human Serum**, the latter preferably from a recently cured case of chancroid, would be efficacious. He has had good results from application of the patient's own serum, especially when the patient was receiving injections of dmelcos.

REFERENCES.—¹*Med. Press and Circular*, 1933, May, 398; ²*Gen. Practice*, 1933, April-June, 93.

CHICKEN-POX.

J. D. Rolleston, M.D., F.R.C.P.

ETIOLOGY.—C. R. Amies¹ has confirmed the findings of Aragão (1911) and Paschen (1919) that the vesicle fluid of chicken-pox contains large numbers of elementary bodies. He prepared suspensions of these bodies in normal saline containing 2 per cent of sodium citrate, and found that they were specifically agglutinated by the serum of patients convalescent from varicella. As the result of examination of 61 sera obtained from 55 varicella patients he found that with few exceptions agglutinins appeared in the blood about five days after the onset of the eruption and persisted therein for some time. Amies regards the constant presence of the elementary bodies in the early vesicle fluid and their agglutination by the homologous antiserum as strong evidence of their representing the actual infecting agents of varicella.

SYMPTOMS AND COMPLICATIONS.—A. G. G. Thompson,² the Medical Officer of Health of Lambeth, reports on 1190 cases of chicken-pox which he has seen during the last four and a half years. The youngest was 7 weeks and the

oldest 76 years, the next oldest being 66, 64, and 57. Two cases, aged 7 and 10 years, were of the hæmorrhagic type, and both recovered. The severest cases occurred in the age groups from 20 to 40 years. No patient had any history or scars of a previous attack.

In a paper on *varicella in old age*, J. D. Rolleston³ states that of 32 cases of chicken-pox in patients of 18 years and upwards under treatment in the Western Hospital (L.C.C.) from Jan. 1, 1926, to Sept. 30, 1932, only 3 were over 30 years of age—namely, two men aged 31 and 64 respectively and a woman aged 76. The man aged 64, in whom the diagnosis of chicken-pox had been confirmed by Wanklyn, was one of a series of five fatal cases of the disease which Rolleston had seen in the course of thirty-two years' fever practice. He was an alcoholic and debilitated subject who was admitted to hospital with a copious eruption of varicella complicated by bronchopneumonia and albuminuria, and died three days later. The necropsy showed bronchopneumonia of both lungs, a large and fatty heart, and cirrhosis of the liver. In the woman aged 76, the eruption presented the typical appearance and distribution of varicella, but on the left side of the front and back of the chest and left arm where she had undergone deep X-ray therapy for lymphosarcoma the rash was confluent. Uncomplicated recovery took place.

Other cases of varicella in old age have since been reported at 80 (A. Joe⁴), 81 (B. Barling and J. Cahill⁵), 82 (W. H. S. Armstrong⁶), 88 (G. L. Webb,⁷ A. Joe⁴), and 93 (C. C. Coombs⁸).

P. Bérode⁹ has collected 74 cases of varicella with *nervous complications* in patients aged from 4 months to 32 years, most of which have been recorded in the last six years. The onset was sudden. There was almost always an interval of from five to seventeen days between the eruption of varicella and the onset of the nervous symptoms. The attack of varicella was usually normal otherwise. Uneventful recovery was the rule; only two of the 74 cases proved fatal. All parts of the nervous system may be affected, but the choreo-athetotic cerebellar forms and meningitis are the varieties most frequently encountered. In some cases, including one observed by Bérode, the reaction of deviation of the complement performed with an emulsion of recent varicella scabs proved positive. The etiology of these nervous phenomena is still obscure. It is possible that there is an unknown neurotropic virus which is roused into activity by the varicella infection, as in the nervous complications of other eruptive forms. On the other hand, it is possible that the varicella virus itself under certain conditions, such as special susceptibility of the individual, may become neurotropic. Neither of these hypotheses has at present received any anatomical, bacteriological, or serological confirmation.

J. Hallé and P. Arondel¹⁰ record the case of a boy, aged 2½ years, admitted to hospital with symptoms of *meningitis*, which had set in on the previous day. On lumbar puncture the fluid was clear and not under hypertension, as well as quite normal in composition. On the evening of the third day the meningeal symptoms began to subside, and they completely disappeared on the fourth day when the eruption of varicella appeared. The subsequent course of the disease was mild and uncomplicated.

Two cases of *encephalitis* following varicella have recently been published by F. M. Fry¹¹ and P. Mühlenkamp¹² respectively. Fry's case was that of a girl, aged 10 years, who developed symptoms of encephalitis in the first week of a profuse eruption of varicella, characterized by dizziness and right hemiplegia. Return of power was slow and gradual, but complete recovery took place in fifteen months from the onset. Mühlenkamp's patient was a boy aged 3½ years, who on the fifth day of a typical attack of varicella, when the

lesions had dried up, developed symptoms of encephalitis as shown by toxic and clonic convulsions, followed by tremor of the head, hands, and feet. Under treatment by lumbar puncture, which gave issue to cerebrospinal fluid under slight pressure, improvement took place and all the symptoms disappeared in nineteen days from the onset.

REFERENCES.—¹*Lancet*, 1933, i, 1015; ²*Brit. Med. Jour.* 1932, ii, 1214; ³*Ibid.* 1007; ⁴*Ibid.* 1125; ⁵*Ibid.* 1081; ⁶*Ibid.* 1125; ⁷*Ibid.* 1125; ⁸*Ibid.* 1125; ⁹*Thèse de Paris*, 1932, No. 553; ¹⁰*Bull. Soc. de Péd.* 1933, 104; ¹¹*Canad. Med. Assoc. Jour.* 1932, xxvii, 284; ¹²*Arch. f. Kinderheilk.* 1932, xeviii, 81.

CHOLANGITIS. (See GALL-BLADDER AND BILE-PASSAGES, SURGERY OF; JAUNDICE, CATARRHAL, SURGICAL TREATMENT OF.)

CHOLECYSTITIS. (See also GALL-BLADDER, SURGERY OF.)

Robert Hutchison, M.D., F.R.C.P.

W. Magner and J. M. Hutcheson¹ have investigated the bacteriology of cholecystitis in 200 gall-bladders removed at operation. They conclude that chronic cholecystitis is due in most cases to a streptococcal intramural infection of the gall-bladder, but other bacteria, notably those of the typhoid group, may also cause it.

A. F. Hurst² draws attention to the frequency of *B. coli* infection of the gall-bladder and suggests that the infection is an ascending one from the duodenum and that the frequently coexisting achlorhydria favours this. Anatomical abnormalities of the biliary tract may predispose to the infection just as they do in the urinary tract. The symptoms are those of 'gall-bladder indigestion', flatulence and nausea being conspicuous. In mild cases there is no colic or pyrexia, and jaundice never occurs. *The gall-bladder may show no abnormality on cholecystography.*

TREATMENT.—This consists in: (1) Attempting to sterilize the gall-bladder by large doses of **Hexamine** (60 to 100 gr. with an equal quantity of soda bicarb. and sod. cit. t.i.d. p.c.); (2) Promoting biliary drainage by giving a concentrated solution of **Magnesium Sulphate** in a dose just short of that which causes diarrhoea, every morning fasting, and a tablespoonful of **Olive Oil** before each meal; (3) Putting the patient upon a **Cholesterol-free Diet**.

REFERENCES.—¹*Canad. Med. Assoc. Jour.* 1932, Nov., 469; ²*Guy's Hosp. Rep.* 1932, Oct., 396.

CHOLERA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—Three lengthy papers on studies of cholera bacteriophage are published by I. N. Asheshov, I. Asheshov, S. Khan, and M. N. Lahiri,¹ on the complicated technique of the subject. The first deals with culture media (the basis of which is papain-digested meat and broth), special test-tubes, candles for filtration, the collection and dilution of material, and the isolation of pure-line types of bacteriophage. In the second part the classification of bacteriophage is considered, of which five types of cholera phage are already recognized on the basis of their reciprocal compensatory action on bacterial cultures. In Part III the virulence and development of bacteriophage is dealt with, and the virulence is considered as an intrinsic property of the bacteriophage corpuscle as shown by its power to develop within and at the expense of bacteria, causing their destruction. The degree of virulence is considered to be higher as multiplication and destruction are more rapid, and a new virulence test is suggested based on determination of the rate of multiplication.

The influence of hydrogen-ion concentration on cholera bacteriophage is considered by R. S. Rao,² who concludes that "within the optimum limits

lysis by type A of cholera bacteriophage is enhanced by increasing acidity, and that by type B by increasing alkalinity". He also suggests that Asheshov's different grades of roughness can be altered appreciably by changing the pH of the culture medium. C. L. Pasricha and A. J. De Monte³ report further on cholera phage type E and a sixth type F, and they suggest a classification according to their lysability by pure-line cholera phages, and that B, C, and D types undergo a mutation in nature, thus still further complicating the matter.

The methods and results of forecasting cholera, small-pox, and plague incidence in India, with a forecast for 1933, are dealt with by L. Rogers.⁴

The 'bogy' of the negative phase of increased susceptibility to cholera for a short time after anti-cholera inoculation is once more disposed of by A. D. Stewart,⁵ who quotes the opinion of Topley and Wilson that from the point of view of prophylaxis it can probably be disregarded.

The bactericidal action of **Di-hydranol** in human cholera carriers is reported on by L. Leiva,⁶ who finds that it ranks favourably with salol-urotropin treatment for this purpose as the result of a comparative trial in 70 cases. The doses were two of 0.15 grm. of dihydranol in 25 per cent olive oil three times a day for the first two days, and three doses thrice daily from the third to the seventh day.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1933, April, 1109, 1127, 1159; ²*Ibid.* 1932, Oct., 377; ³*Ind. Med. Gaz.* 1932, Sept., 487; ⁴*Ibid.* 1933, Jan., 1, and March, 125; ⁵*Ibid.* 1932, Sept., 515; ⁶*Amer. Jour. Trop. Med.* 1932, Nov., 509.

CHOREA.

Macdonald Critchley, M.D., F.R.C.P.

On account of its frequent occurrence as well as the interesting historical and clinical associations, chorea forms an apposite subject for review. The popular designation 'St. Vitus's dance' dates from the early middle ages, when the notorious dancing epidemics formed an interesting example of mass hysteria. In Italy the outbreak of dancing fury was popularly attributed to the bite of a spider or tarantula, and the name 'tarantism' arose in consequence. There was close connection between the dancing furor and religious ecstasies, and on certain feast-days tarantism reached an especially high pitch. The days of St. John the Baptist and of St. Vitus (June 15) were particularly favoured, and the latter has since been closely associated with the occurrence of unrestrained bodily movements of pathological nature. Vitus was a Sicilian youth, put to death in the year 303 A.D. During the fourteenth century the legend grew up that immediately before death Vitus prayed that he might be given the power to protect from the dancing mania all those who would solemnize the day of his commemoration. A voice from heaven ratified this request, and thus St. Vitus became the patron saint of the dancing votaries.

PRESENT CONCEPTION.—Spontaneous movements of 'choreiform' type are encountered in many pathological states, in subjects of divers ages and type. It has been suggested therefore that 'chorea' is simply a descriptive label, and merely indicates a striking symptom depending upon interference with particular neuro-anatomical structures. To-day, however, there is no agreement as to which regions of the brain are associated in a diseased state with chorea. The balance of opinion, nevertheless, still seems to favour the basal ganglia, and the subthalamic structures in particular, as the regions where one expects to find alterations in a fatal case of chorea. The mechanism whereby the movements are produced still remains unexplained.

TYPES.—For the purposes of definition it is convenient to enumerate the main morbid conditions under which choreiform movements may be seen.

Such a 'classification' is purely clinical or descriptive and possesses no scientific or etiological properties. The chief types of chorea, then, are the following:—

Sydenham's chorea (chorea rheumatica).
Chorea gravidarum.
Huntington's chorea.
Senile chorea.
Chronic progressive chorea.
Apoplectic chorea (post-hemiplegic chorea).
Hysterical chorea.
Chorea associated with certain infections (e.g., epidemic encephalitis; diphtheria).

SYMPTOMATOLOGY.—The clinical evidences of chorea are too well known to permit any detailed recapitulation. It will perhaps be justifiable to survey them from a comparative standpoint, and to stress the so-called 'minor signs' of chorea. The symptomatology of Sydenham's chorea may be taken as typifying the other varieties. The character of the choreiform movements are well known, and easily recognized once pointed out. Large irregular movements of the limbs and face, spontaneous rather than involuntary, capable of temporary control by the will, immediately exaggerated by volitional or emotional activity—these are the outstanding features. Choreiform movements, indeed, closely resemble purposeful 'voluntary' movements, and on this account they may be overlooked.

The 'minor signs', however, are more important, for they are usually demonstrable throughout the course of an attack of chorea. Movements, on the other hand, may actually be in abeyance although chorea is present. This is the case at two periods: in the very earliest stages, and secondly in the advanced cases where immobility replaces movement ('paralytic chorea'). 'Minor signs' are therefore of diagnostic as well as prognostic significance. They may be briefly enumerated, as follows: (1) *Hypotonus*; most marked in the more affected limbs. (In the non-rheumatic types of chorea, hypotonus may be less easily demonstrable.) (2) *Disorders of speech*; ranging from dysarthria through poverty of speech to a complete mutism in severe cases. (3) Certain *characteristic attitudes* which in turn depend upon the hypotonus. Chief among them are the *choreic hand* (hyperflexion of the wrist with hyper-extension and abduction of the fingers); the *pronator forearm sign* (best seen when the patient raises the arms above the head); and the *choreic tongue* (which is protended and withdrawn in an abrupt and almost snakelike manner). (4) *Alterations in the reflexes*, particularly the knee-jerks. These are rarely normal, but the type of alteration is variable. Occasionally, no knee-jerk can be elicited; more often a 'pendular' type of response is seen, whereby the leg swings backwards and forwards as in cases of cerebellar disease. Thirdly there is the *sustained knee-jerk* which is the typical choreic knee-jerk of the text-books. (5) *The gait* is often diagnostic; a child with rheumatic chorea walks without swinging the arms, but displays wriggling or writhing movements of the head, neck, and trunk. (6) Some degree of *muscular weakness* is usually present and may be striking in the so-called 'paralytic cases'. The weakness is chiefly shown as a lack of maintenance of contraction. This defect is best shown by the 'choreic hand-grasp'. As the patient squeezes the examiner's hand it is noticeable that the contraction is not steadily sustained but alternately waxes and wanes in strength.

TREATMENT.—The most impressive feature about the treatment of chorea is the extreme multiplicity of measures that have at one time or other been recommended. Doubtless this fact itself is of significance. Unquestionably, **Prolonged Rest** is the most important (and perhaps the only important)

measure in treating acute cases of chorea (Sydenham's chorea, chorea gravidarum). In the chronic and progressive types, including the senile and Huntingtonian varieties, the value of rest is slight. The practical difficulty is to obtain the consent of the parent and patient to an adequate period of rest, and there is a tendency for the child to return to school much too soon. Rest is indicated, of course, not only as a direct means of restraining the chorea, but as an assurance against cardiac complications. The older practice of 'isolation behind screens' is nowadays usually regarded as an unnecessary and even deleterious hardship. A commonsense degree of mental and emotional quiet will suffice. The **Diet** should be rich and plentiful, the aim being to 'feed up' the patient. Of **Drug** therapy but little can be said with confidence. The numerous curatives can be divided into two classes—namely, a group of sedative drugs and a group of specific (anti-rheumatic) drugs. To the first belong such drugs as potassium bromide, luminal, arsenic (whether in increasing or in short doses), chloretone. Chief among the latter class are the salicylates. Perhaps to both groups belong the two drugs nirvanol and aspirin, as combining sedative properties with possibly a specific action on the rheumatism. Such drastic measures as repeated lumbar puncture, intrathecal injection of magnesium sulphate, and fever therapy, may be mentioned merely as historical curiosities, for few would be so rash as to advocate these procedures in a rheumatic child suffering from a self-limiting nervous complication. If drugs are to be employed, there is much to be said for the use of **Aspirin** in 10-gr. doses thrice daily. Only rarely is it necessary to add a little **Bromide**; in relapsing or intractable cases **Chloretone**, in doses of 3 or 4 gr. thrice a day, is often most efficacious. When sleeplessness is prominent, **Chloral Hydrate** is by far the best drug; as C. Wall has pointed out, other hypnotics may even irritate the choreic patient.

Chorea Gravidarum.—Until recently this form of chorea has been but dimly understood, and has puzzled obstetricians and neurologists alike. The recent survey of over 1000 cases of this disorder made by P. Willson and A. Preece¹ has, however, thrown considerable light upon both etiology and symptomatology. According to the authors' statistics, chorea gravidarum occurs about once in every 3000 pregnancies. It is essentially a disease of younger women, and in over 17 per cent of their cases the patient was unmarried. Evidence of previous chorea occurring during childhood is obtainable in 61 per cent of cases; one-third of their cases gave a history of previous rheumatism; and almost half gave suggestive evidences of carditis. Out of 67 fatal cases with post-mortem examination, cardiac lesions were found in 87 per cent. Twenty-five per cent of girls who have chorea during childhood are likely to have a recurrence during pregnancy.

Chorea gravidarum usually commences early in pregnancy. The average duration of the disease is six weeks in the fatal and ten weeks in the non-fatal cases. In almost half the cases pregnancy goes to term. Fever is a rare but grave symptom. Clinical and biochemical evidences of toxæmia are usually absent. The mortality rate for the whole of the authors' cases was 18 per cent. (In 1880 it was 25 per cent and more recently only 12 per cent.) Of the recurrent cases of chorea gravidarum 10 per cent only ended fatally. The death-rate was lower in the younger subjects. In patients in whom labour was uninterrupted at full term the mortality was 13 per cent; where there was intervention it rose to 33 per cent; where spontaneous premature birth occurred it was 34 per cent. The foetal mortality amounted to 57 per cent.

TREATMENT.—The authors make the following suggestions: Conservative measures should on the whole be followed. The **Diet** should be rich but

easily digested. A cautious employment of sedatives (**Chloral** or the **Barbiturates**) is recommended, but morphia and chloroform are contra-indicated. Labour should be induced: (1) If a régime of rest, sedation, seclusion, and nourishment fails; (2) If the movements become very violent; (3) If the speech becomes incoherent; (4) If the mentality becomes clouded; and (5) If insomnia persists.

REFERENCE.—¹*Arch. of Internal Med.* 1932, xlix, 471.

CLEFT PALATE. (See HARE-LIP AND CLEFT PALATE.)

CLUB-FOOT. (See DEFORMITIES.)

COARCTATION OF THE AORTA. (See HEART DISEASE, CONGENITAL.)

COCCYGEAL SINUS. (See also CYSTS AND FISTULÆ; PILONIDAL SINUS.)

J. P. Lockhart-Mummery, F.R.C.S.

This condition is chiefly of interest because it is often confused with fistula in ano, with the result that it is wrongly treated and cannot be made to heal.

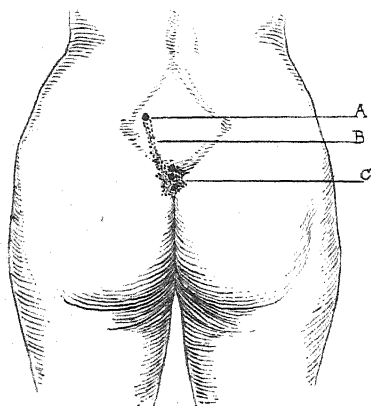


Fig. 33.—A "diagrammatic representation of a coccygeal sinus. A, Small hard nodule to one side of the middle line, either temporarily healed over or showing a small opening with heaped-up granulation tissue; B, Firm hard core leading downwards and towards the middle line; C, Tiny orifices situated accurately in the middle line. (By kind permission of the *British Journal of Surgery*.)

The sinus, or fistula, is always situated just over, or quite close to, the tip of the coccyx (Fig. 33). Sinuses due to suppuration may spread in other directions, but the primary lesion is always in the same position. It is due to a congenital fault in foetal development and is really caused by an inclusion dermoid. The main or primary sinus is lined with skin and often contains hairs. There are two main theories as to the causation of this sinus: (1) That it is a sequestration dermoid due to faulty coalescence of the skin; (2) That it arises from the remnant of the spinal canal known as the coccygeal vestige. The post-anal dimple, which is present in some 20 per cent of individuals, is a less advanced form of the same condition. The practical point which is of importance is that the sinus, being lined with skin, will not heal up unless all the area is completely removed.

Merely laying the sinus open, which

would be effectual in a rectal fistula, is of no use in these cases.

R. L. Newell¹ gives an excellent description of the condition, with a report of eleven cases. He advises complete removal of the whole extent of the sinus. The area that it is desired to remove may be defined by the use of a lipiodol injection and X rays, or by the injection of paraffin wax just before operation.

REFERENCE.—¹*Brit. Jour. Surg.* 1933, Oct., 219.

COLI BACILLURIA. (See PYLOCYSTITIS; PYURIA IN CHILDREN; URINARY ANTISEPTICS.)

COLON, MELANOSIS OF.*Robert Hutchison, M.D., F.R.C.P.*

H. L. Bockus, J. H. Willard, and Joseph Bank, in a comprehensive review¹ of this condition, point out that although melanotic pigmentation of the colon has been recognized for more than a century, very little has been written about it clinically. They found it present in 4.7 per cent of 553 patients subjected to routine examination with the sigmoidoscope, and give details of 41 cases. The pigmentation is usually most intense in the rectum, fading out in the upper sigmoid in many cases. The colour varies from buff to dark brown or black, the deeper shade being broken up into polyhedral designs by lighter striae. The appearance has been likened to that of a toad's back or to snake, crocodile, or tiger skin. To the authors it suggests the cross-section of a nutmeg. Microscopic examination shows that the pigment lies within large mononuclear cells in the tunica propria of the mucosa; it belongs to the group of melanins. The origin of the pigment has been disputed, but the authors are convinced that it is derived from a laxative containing anthracene or emodin compounds. All their patients had been using laxatives of this kind, usually cascara, for years. The pigmentation does not of itself cause symptoms, and if the laxative is discontinued, the pigmentation disappears in from four to twelve months.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1933, July 1, 1.

COLON, SURGERY OF.*A. Rendle Short, M.D., F.R.C.S.*

Ulcerative Colitis.—J. A. Bargaen, P. W. Brown, and F. W. Rankin¹ describe the experience of the Mayo Clinic of **Ileostomy** for intractable types of this disease. They do not believe caecostomy or appendicostomy do much good, and ileostomy is being done less and less frequently, and only in chronic cases. Acute ulcerative colitis is not a surgical proposition. Ileostomy has been performed on 82 patients in ten years, whereof 26 died soon, and 15 later. They divide the ileum 6 in. from the caecum, close the distal end, and exteriorize the proximal end; this makes a subsequent resection of the colon easier. The ileostomy will probably be lifelong. [Our experience of appendicostomy, or if that is insufficient, of caecostomy or transverse colostomy, closed after six months, is much more favourable.—A. R. S.]

Tuberculoma of Caecum.—In a paper on this subject by F. W. Rankin and S. G. Major,² 65 cases from the Mayo Clinic are reviewed. There is usually a long history, running to several years, too long for carcinoma. Sometimes the symptoms are dyspeptic in character, and are likely to be labelled 'chronic appendicitis' or 'cholecystitis'; in other cases there is definite intestinal obstruction. Pain and loss of weight are very constant. There is often diarrhoea. A lump may be palpable. Signs of pulmonary tuberculosis are not usually detected. The barium enema, or meal and enema, shows a filling defect.

Excision by **Hemicolectomy**, the operation of choice, was performed on 50 patients, of whom 4 died, and 9 more within two years. Of those followed up, 19 were well or nearly well. Short-circuiting was less successful.

Cancer of Colon.—C. P. Wakeley and R. Rutherford³ give their experience of cancer of the caecum. It is often confused with chronic appendicitis. There is in the majority of cases a palpable tumour long before obstructive symptoms develop, and pain is absent. The barium enema shows a filling defect. The best treatment is an **Ileo-colostomy** followed a week or two later by **Hemicolectomy**. If the symptoms are of less than a year's duration, a cure will probably result, but if the symptoms exceed the year, the patient will probably die before another twelve months is out.

W. D. Haggard,⁴ of Nashville, lays emphasis on the importance of taking notice of slight symptoms which may point to an early carcinoma of the colon:

increasing constipation, flatulent dyspepsia, borborygni, mild abdominal pain, blood per rectum. These all call for careful investigation in a patient past forty. The barium enema is better than the barium meal, if for no other reason than that the barium taken by mouth occasionally blocks the lumen of the growth and precipitates obstruction. The best method for operation for cancer of the sigmoid is to bring the growth outside, remove it, and leave the two ends of the bowel projecting side by side with a clamp on each. The clamp on the proximal end is removed on the third day; that on the distal end is left to fall off. The artificial anus is closed later by an enterotome followed by a suture operation.

Experience of 453 cases operated on at the Mayo Clinic shows that growths of the right colon furnish more five-year cures (57·6 per cent) than those of the left colon (47·7 per cent). Size of growth has little influence on the prognosis. Lesions that project into the lumen do better, because they cause obstruction and are diagnosed earlier. As might be expected, lymph-node involvement is unfavourable, and the prognosis varies according to the histological classification of grades of malignancy so popular in America. Mucoïd carcinoma is neither better nor worse than the general average. The reporters, F. W. Rankin and P. F. Olson,⁸ consider that the best operation for a growth of the right colon is a two-stage procedure, an **Ileo-colostomy** joining the end of the ileum to the side of the transverse colon, followed later by **Resection**. For the left colon, they advocate the method referred to by Haggard above, and described in the *MEDICAL ANNUAL* last year (p. 113). It is not suitable in the presence of any degree of obstruction. In that case the cæcum or colon must be drained before resection is attempted. The old Mikulicz operation should be regarded as definitely superseded, because it often implants cancer cells in the wound, but it is still the method of choice for a few weakly elderly patients with a long loose sigmoid that can be pulled well out under local anaesthesia. During 1929 Rankin reduced his death-rate for excision of cancer of the sigmoid, in 31 cases, to 9·6 per cent.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1932, Aug., 196; ²*Ibid.* Oct., 494; ³*Brit. Jour. Surg.* 1932, July, 91; ⁴*Surg. Gynecol. and Obst.* 1932, Oct., 501; ⁵*Ibid.* 1933, Feb., 386.

CONJUNCTIVA, DISEASES OF. *Sir Stewart Duke-Elder, M.D., F.R.C.S.*

Ophthalmia Neonatorum.—This is an acute purulent conjunctivitis commencing within the first three weeks of birth, most cases being infected while passing through the parturient canal of the mother.

It used to be considered that practically all cases were due to the gonococcus, but since routine examinations of the bacteriology of the conjunctival sac have been done, it has been found that many organisms are responsible for the disease. Thus, according to a recent computation by A. Temple Thurston, the gonococcus of Neisser is responsible for from 60 to 65 per cent of all cases; the remaining 40 per cent are distributed among the following micro-organisms in varying proportions: streptococci, staphylococci, pneumococci, Koch-Weeks bacillus, Morax-Axenfeld diplo-bacillus, *B. coli communis*, *B. pyocyaneus*, Klebs-Loeffler bacillus. Of these other organisms, by far the most virulent is the streptococcus: it causes a more severe inflammation than even the gonococcus, with complications that may lead to suppurative panophthalmitis. The gonococcus, on the other hand, though it may, and frequently does, cause ulceration of the cornea, is not the cause of a suppurative panophthalmitis.

The disease may run a benign or a malignant course; but in most cases the conjunctival inflammation is very marked and the dominating feature is the large amount of purulent discharge. The essential feature in the treatment of

this disease is the control and timely removal of this discharge, for the intense irritation produces such a degree of blepharospasm and swelling of the lids that the pus tends to get banked behind them under pressure, constituting the most frequent cause of the corneal complications which form the main danger of the disease.

The corneal complications usually start by general infection of this tissue, with the result that it becomes hazy in whole or in part. Later it may break down and ulcerate. The ulcers may be large, extensive, and at first superficial, leaving behind them a dense leucoma. On the other hand, they may be small and deep, rapidly tending to perforation, with the subsequent result of an adherent iris or the formation of an anterior polar cataract. A third and more unfortunate development may occur, especially in marasmic or premature babies—an infiltration of the entire cornea ending in a sloughing of the whole of its central area. Such an accident frequently involves the extrusion of the lens as a complication, and always results in the formation of a complete anterior staphyloma, usually with subsequent buphthalmos.

PROPHYLAXIS.—There is no condition in which prophylactic treatment is more important than in ophthalmia neonatorum. It is essentially a preventable disease; and since the general introduction of prophylactic measures, its incidence has been enormously lessened, and the incidence of blindness considerably diminished. It is essential to attend to the cleanliness of the vagina before the birth of the child; and immediately after birth the infant's eyes should be cleaned with **Boric Solution** and a drop of some **Silver Preparation** instilled. Credé's method, which was once the accepted practice, consisted in the instillation of a drop of 2 per cent solution of silver nitrate into each eye, after the conjunctiva and lids had been carefully cleaned. This is, however, not without danger, and many cases are on record wherein the exhibition of silver nitrate has resulted in a permanent corneal opacity, with gross diminution of vision. It is as efficient and much safer to employ a drop of one of the organic silver compounds, such as **Protargol** or **Argyrol**.

TREATMENT.—With regard to treatment once the disease has started, the method of instilling silver nitrate drops in the eye which was up to recent times recommended must be unequivocally condemned. In the acute stage silver is only too apt to cause complete disintegration of the corneal epithelium, an accident which may readily lead to grave complications. It may be permissible to evert the lids and paint the conjunctiva itself with silver, provided that the greatest care is taken to wash away any excess with saline, which precipitates the nitrate into an insoluble chloride. Much the safest method of treatment is to irrigate the eye frequently with a mild antiseptic, such as a solution of **Eusol** 1-8, followed by drops of **Acriflavine**, 1-1500 in oily or watery solution. The more profuse the discharge the more frequent should these irrigations be, and, if at all possible, the case should be put under the care of a special nurse and treatment should be repeated every hour. No matter how acute the disease is, these frequent irrigations and a complete removal of the discharge must be insisted upon, and if œdema of the lids or blepharospasm prevents their being efficiently carried out, **Canthotomy** should be resorted to—a resort which, fortunately, is rarely necessary. Should corneal ulcers develop, the treatment of the conjunctivitis is continued on these lines with unabated activity, while the ulcer itself is treated in the usual way. It is to be remembered, however, that on account of the discharge a pad and bandage must be dispensed with.

One of the most important points in the care of such cases arises in those in which one eye alone is infected. In this event every precaution should be adopted to prevent contamination of the good eye. The most efficient method

is to cover it completely by a watch-glass secured to the face by adhesive plaster. The plaster should cover the edges of the glass all round its circumference, allowing only a small rubber drain at the lower temporal corner, which, by permitting the entrance of air, prevents steaming of the inner surface of the glass and allows the condition of the eye to be observed.

Throughout the whole course of the disease it is of the greatest importance that every attention be paid to the general health; at all costs the general nutrition must be kept up, and every endeavour made to maintain the resistance of the tissues. If the state of the child permits, it may be advisable in the early stages to give a small intramuscular injection of **Milk**. In a young infant this must be done only with care; but there is no doubt that the effect of the reaction following the injection frequently acts as a charm in controlling the severity and cutting short the duration of the disease.

Vernal Catarrh.—L. Lehrfeld¹ contends that vernal conjunctivitis is an ocular manifestation of an allergy due principally to dusts and pollens, and, having observed that desensitization by means of dusts and pollens does not always effect immediate relief, he came to the conclusion that the avenue of approach in the treatment of this disease would be to render inert the exciting agents that enter the eye, or at least to remove them from the eye in such quantities as to minimize the degree of contact and thus keep the patient comparatively free from clinical symptoms. He advocates the use of **Sodium Carbonate** in solution, 5 to 10 gr. to the ounce of water (0.3 to 0.65 grm. to 30 c.c.), instilling three drops four times daily during the active stages of vernal conjunctivitis, both limbic and palpebral. In addition the eye should be irrigated with cold **Boric Acid** solution by means of an eye-cup, seven times daily.

Patients with this disease invariably state that the itching, which is the most distressing symptom, is relieved after rubbing the eyes and removing what they call long, stringy 'pus'. This mucus is not readily removed in its entirety except by mechanical means with an applicator tipped with cotton. It is found to be continuous in structure with, and bound down in the crevices between, the follicles in the palpebral type of vernal conjunctivitis. The limbic type, as is well known, has very little mucus.

Sodium carbonate, which is an alkali and a solvent of mucus, will render soluble the dusts and pollens that enter the eye, along with the mucus to which the dust particles adhere. Under this treatment it is found that if the alkalinity of the conjunctiva is tested with litmus, it retains the alkalization. Boric acid, being but feebly acid, does not in any way interfere or render appreciably less alkaline the sodium carbonate. What effect the sodium carbonate has on the pollens and dusts is unknown, but it facilitates the ready dislodgement of the mucus which aggravates and intensifies the itching, and in association with the thorough flushings of the eye with boric acid solution there is effected a rapid alleviation of symptoms and a reduction in the size of the follicles.

The author does not claim that this treatment will change the pathological condition in the chronic types in which large granulomas exist, because these are secondary changes which can be removed only by surgery or radium; but he claims that in the initial stages of the disease, during the first and even the second summers, the pathological condition disappears when the exciting cause is removed by the treatment just outlined. It is his belief that the sodium carbonate treatment is not sufficient in itself, but must be accompanied with the thorough flushings of cold boric acid solution at least seven times a day. It is sufficient to use three drops of sodium carbonate four times a day, always preceded by the boric acid flush, thus permitting ample time for partial

disintegration of the mucus and the theoretical destruction of the active principles in the dusts and pollens which are the causative agents. Last summer he used this treatment in twenty-seven cases and found that it excelled any other drugs or chemicals heretofore used. The disappearance of the discharge, the rapid and quick relief from itching, and the recession of the pathological condition are reported as striking.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1933, March 18, 812.

CORNS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The usual treatment for corns is to pare them down and apply collodion paints and protective pads. The treatment is palliative. Just as in bunions, there is a hyperostosis which forms a minute prominence at the interphalangeal joint. A bursa may underlie a well-defined corn, and, as in the case of bunions, becomes readily inflamed.

If operation for such conditions as corns, hammer-toes, etc., is contemplated, excellent local anaesthesia will be obtained by inserting a dental needle under the skin at each side of the toe, and injecting 1 per cent novocain and adrenalin solution. The tissues become swollen on the introduction of the fluid and complete anaesthesia is obtained in about thirty seconds.

W. L. Galland¹ draws attention to some of these points. After the foot has been properly prepared, the keratinized epithelium is removed with a sharp curette. The entire superficial structure of the corn can be removed *en masse*. The writer recommends a flap of the deep tissues to be raised with a proximal base so as to expose the underlying bursa and slight bony prominence. The latter is removed with a small chisel. Patients are usually able to walk about immediately after the operation provided they wear a shoe liberally cut out. After operation a considerable amount of keratinized skin may be found over the operated area. It at first appears as if the corn is returning, but in the course of ten days the mass is completely exfoliated. Galland concludes: (1) Painful corns are pathologically similar to bunions and can be effectively cured by operative means; (2) The operation described eliminates the pathologic sources of irritation by removing the bursa and the exostosis underlying the corn; (3) The operation causes a minimum of discomfort to the patient; (4) In the series of corns operated on, the results have been extremely satisfactory, and no recurrences have been noted to date.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1933, March 25, 880.

CORONARY ARTERY DISEASE.

A. G. Gibson, M.D., F.R.C.P.

F. C. Wood and C. C. Wolferth¹ have made some experimental observations on the effects of coronary occlusion in the dog. Their results show that if conduction from all the surfaces of the heart is adequate, and if an anterior posterior chest lead is used in addition to the routine limb leads, deviation of the RS-T interval can be recorded in one or more leads after occlusion of any one of the three main arterial trunks; that when the left descending artery is occluded the R_c-T variation appears only in the antero-posterior chest lead. This confirms the view that the antero-posterior chest lead in addition to Leads I, II, and III is of value in the detection of coronary thrombosis. This is confirmed by L. Levin,² who refers to three cases of cardiac infarction; in two of these the normal characters of the electrocardiogram for this condition were absent. In two of the three cases in which Lead IV was taken there were characteristic changes. This lead is made with the right-arm wire placed anteriorly near the apex beat and the left-arm wire posteriorly directly opposite. The normal curve in this lead shows the P wave usually inverted, the Q wave enlarged, and the T wave inverted. The special characters of this lead in

coronary thrombosis were a depression in the ST interval and a diphasic T wave. All three cases showed clinical signs of coronary thrombosis.

W. Evans and C. Hoyle³ refer to cases mentioned by Parkinson and Bedford in which during an attack of temporary ischæmia of the heart wall a slight degree of inversion of the T wave in Lead I and an upright T wave in Lead II become inverted, and are restored to their usual form after the cessation of the pain. These authors have investigated 32 patients, in 22 of whom the tracing showed inversion of the T wave in one or more leads: 23 of these patients suffered from recurrent attacks of angina pectoris. In the first group showing inversion or flattening of the T wave in Leads I and II, of 9 cases 5 had angina pectoris, and in 7 of these an inverted diphasic or flat T wave became raised following the administration of nitrite. In the second group (7 cases) in which the T wave was inverted in Lead I, only 2 cases following nitrite administration showed a return to the upright form. In the other 5 cases there was no change. In the third group (4 cases) in which the T wave was inverted in Leads II and III, in one case it became upright in Lead II. In the fourth group (3 cases) with inversion of the T wave in Lead III only, in one case the inverted T wave in Lead III became raised to the iso-electric level, and an upright T wave in Lead I was also raised. In all cases except one the pulse-rate and blood-pressure returned to normal before the effect of the nitrite on the T wave had worn off. The authors look upon the explanation as the result of an increased blood-supply to the cardiac muscle on vasodilatation. They refer to experimental work in dogs, in which the ligation of separate branches of the coronary artery caused the T wave to become inverted, to the fact that cooling of the apex of the heart produces a similar effect, and to the evidence that experimentally nitrite increases the blood-supply of the myocardium.

G. Fitzhugh and B. E. Hamilton⁴ have classified the determining factors of coronary occlusion in 100 private cases and they conclude that exertion or strain is a primary factor in determining the cardiac lesion. In 189 attacks from which these 100 patients had suffered, no fewer than 99 were brought on by some form of unusual physical exertion. Of other cases, in 33 attacks, travel was the immediate antecedent, in 13 emotional strain, and in 16 over-eating. It follows from this that all patients who have suffered from an attack of coronary thrombosis and have recovered sufficiently to undertake ordinary duties should live a restricted life in regard to exercise and those factors which put a strain on the heart.

E. C. Bartels and H. L. Smith⁵ found that in 88 per cent of a series of 42 cases of cardiac infarction there was gross cardiac hypertrophy even after all other known causes of hypertrophy had been excluded. In 5 cases only was the weight of the heart not above normal. The conclusions therefore are that cardiac infarction is a cause of cardiac hypertrophy.

P. D. White⁶ records some unusual cases of longevity after coronary thrombosis. He mentions that Jegorow records survival up to fifteen years, and in Connor and Holt's series of 117 cases 3 survived over eleven years, 2 over twelve years, and 1 patient twenty years. White also records a case that he had reported in 1931 that had survived seventeen years. He was a minister, aged 67, still active, though bothered occasionally by substernal oppression and by paroxysmal dyspnoea. Another patient is reported in detail who at the age of 63 had had an attack of coronary thrombosis but recovered and was able to take normal exercise for many years. He died at the age of 80 from a cerebral lesion, and was found to have a scar in the posterior wall of the left ventricle, the result of occlusion of two branches of the right coronary artery.

J. Parkinson⁷ reviews the subject of coronary thrombosis. While much of the review is common knowledge it might be well to give his conclusions on treatment. **Morphine** must be given in the initial attack in full doses in order to get good relief from the pain and to ensure the cardiac and bodily rest necessary for healing. Digitalis is not necessary unless there are signs of congestive cardiac failure. The nitrites are contra-indicated because of the lowering of the blood-pressure. In regard to subsequent treatment, the same necessity for **Rest** as in rheumatic fever is clearly required, and he suggests a minimum of six weeks' complete rest in bed. This enables the patient also to realize that his condition is serious and to arrange his future accordingly. He suggests that an explanation of the so-called heart attack should be given to the patient so that he may understand what it means. The best way is to suggest that there has been a tiny clot of blood in the vessel of the heart muscle and to draw the inference that the effects of this clot have to be overcome by a process of natural healing.

REFERENCES.—¹*Arch. of Internal Med.* 1933, May, 771; ²*Med. Jour. and Record*, 1932, Nov. 16, 421; ³*Lancet*, 1933, i, 1109; ⁴*Jour. Amer. Med. Assoc.* 1933, Feb. 18, 475; ⁵*Amer. Jour. Med. Sci.* 1932, Oct., 452; ⁶*Jour. Amer. Med. Assoc.* 1933, Jan. 28, 233; ⁷*Brit. Med. Jour.* 1932, ii, 549.

COSMETICS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Alice Carleton¹ discusses the uses and dangers of cosmetics. She first describes some of the preparations in common use:—

1. *Toilet powders* consist of a mixture of vegetable or mineral powders, colouring matter, and perfume. The vegetable powders include rice, wheat, cornflour, starch, acacia, and tragacanth; the mineral powders, chalk, kaolin, talc, magnesium carbonate, bismuth nitrate or carbonate, and zinc oxide. The dyes may be of vegetable origin or may be aniline derivatives. Various ethereal oils are used as perfumes, and orris root is frequently employed as a fixative. The majority of these substances are entirely harmless. The most dangerous powder ingredient, which is now practically never employed, is lead used in the form of acetate or carbonate. Bismuth may be harmful if absorbed in sufficient quantity. Toilet powders occasionally affect persons who are hyper-sensitive or allergic to certain substances; thus eosin, which has been used to colour certain powders, causes dermatitis in a few persons, and orris root may give rise to asthma or hay-fever as well as to dermatitis. Rice, wheat, and cornflour have also been found to be allergens.

2. *Lipsticks* consist of varying mixtures of paraffin, lanolin, and spermaceti with a dyestuff. They rarely cause irritation. The rare case of cheilitis (inflammation of the vermillion border of the lips) is generally due to the dye, and disappears as a rule with a change of lipstick.

3. *Cold creams* are mixtures of fat and water, with or without the addition of other ingredients. Their quality depends on the fineness of division of the fats—hence the superiority of proprietary mixtures. Some face creams, however, contain, in addition, lead or mercury in the form of white precipitate or calomel. Chronic lead poisoning has been described from use of a cold cream. Creams and lotions containing perchloride of mercury in strengths up to 1-200 and white precipitate as strong as 50 per cent are recommended by so-called 'beauty experts' as skin bleaches: their persistent use has been known to cause a facial pigmentation very difficult to remove.

4. *Vanishing creams* are relatively fatless creams, and are composed of potassium and sodium stearate and glycerin, together with a little fat and rose-water or perfume. Semi-fatless creams may contain almond oil, wax, or gelatin. Casein, an occasional constituent of vanishing creams, may produce allergic reactions.

5. *Depilatories* are mainly composed of sulphides of barium, calcium, sodium, strontium, or magnesium. They appear to be generally harmless, but in sensitive skins may give rise to a dermatitis.

6. *Wrinkle removers* are astringent lotions, mostly harmless and ineffective.

7. *Hair dyes* fall into four classes: (a) Vegetable dyes, such as henna, which is non-irritating but sometimes makes the hair brittle. (b) Metallic dyes, which include the salts of silver, copper, mercury, lead, nickel, cobalt, and bismuth. The metal combines with sulphur in the hair to form a deposit of metallic sulphide. These dyes may cause dangerous intoxication from absorption as well as a local dermatitis. (c) Compounds of metallic salts and vegetable products, such as pyrogallie acid. In these not only the metallic salts, but also the pyrogallie acid, are potentially toxic and irritant. (d) Aniline derivatives, of which the best known is paraphenylenediamine. This dye is extremely popular as it produces better cosmetic results than any of the others mentioned, but it causes in sensitive individuals very severe and persistent dermatitis, cases of which are not infrequent. Not only is it a skin irritant but it may produce gastro-intestinal and nervous symptoms, including retro-bulbar neuritis. Several fatal cases have been recorded. The patient's sensitiveness to this dye can be tested previously to application by a skin test.

In addition to the actual dye, other substances are used in connection with hair dyeing. Strong alkaline washes are generally used as a preparatory measure and these in themselves may set up a dermatitis. Further substances used to remove dyes, such as oxalic or hydrochloric acids, are dangerous, and still more so potassium cyanide. Hydrogen peroxide, though harmless to the skin, may make the hair brittle.

8. *Hair lotions* may contain substances which are irritating, such as quinine, salicylic acid, or resorcin. Cases of dermatitis have also been described from the use of arsenious oxide and lead in hair lotions.

Dr. Carleton points out that owing to the fact that so many substances used in cosmetic preparations may cause trouble in certain cases, there has been a tendency to condemn cosmetics outright. She quotes MacKenna as stating that cold creams and vanishing creams "block the sebaceous and sweat glands", and that their use leads eventually to acne rosacea and acne vulgaris. She points out that McCafferty and Genovese were unable to detect clogging of the pores in twenty-five cases which they observed. These authors also observed the effect of a few weeks cleansing the face with soap and water in persons with moderately dry skins, and they found that mild desquamation appeared with a feeling of tautness. This disappeared with the application of cold cream. They concluded that soap and water were suitable for oily skins and cold cream for dry skins. Vanishing creams they condemned as of no value, on the ground that these creams were only used as a basis for powder and that the same purpose could be served equally well by cold creams.

Dr. Carleton points out that from the æsthetic point of view this is not quite true, as their fatty nature makes the skin too shiny, and for this reason women dislike them. It is, however, felt by some that vanishing creams are too drying and for this reason the author decided to test them. She made trials in 40 individuals, mostly girl undergraduates. A vanishing cream was rubbed in to the right side of the face at night and rubbed off in the morning. The other side of the face was left untreated and used as a control. The duration of the test was from four to six weeks in April and early May, a period when many women notice a temporary roughness of the face, generally attributable to spring winds. In 24 cases there was no change at all; in 12 the untreated side became rough, while the treated side remained smooth. In 1 case both sides desquamated but the untreated side was rougher; in 1 case both sides

desquamated equally; in 1 case only the treated side desquamated, and in 1 case small pustules appeared on the treated side. Thus 13 out of the 40 cases were definitely benefited, while another 24 were unaffected. Finally, Dr. Carleton quotes Kromayer, who says that "salves and pastes and the like cause no change in the skin that can produce a bad cosmetic effect."

F. A. Diasco² divides *hair dyes* by their toxic qualities into three groups: (1) Harmless dyes: all dyes of vegetable origin, except pyrogallol; dyes based on iron, potassium permanganate, hydrogen peroxide, and kohl. (2) Toxic but not really dangerous if the toxic ingredients are not present in too high a degree of concentration. This includes pyrogallol and the majority of metallic dyes. (3) Dangerous dyes: those based on paraphenylenediamine and allied coal-tar products; others based on such highly toxic metals as mercury. It is an essential feature of all hair dyes to deposit, during the action of dyeing itself, an insoluble pigment in or on the hair. In the chemical reactions involved in the development of this pigment, not only the constituents of the dye, but also the oxygen in the atmosphere, and the hair itself, may take part. Thus in the case of henna the combination is between the dyestuff and the keratin of the hair; in the absence of an oxidizing agent (walnut extract, rasticks, etc.) the atmosphere plays a rôle in dyeing. Metallic dyes of the progressive type take advantage of the presence of sulphur in keratin and the pigment formed is a coloured metallic sulphide. Other types of reaction are: double decomposition in certain types of two-solution metallic dyes; pigment produced by means of reduction (silver-pyro dyes); pigment produced by oxidation by suitable oxidants (para dyes); pigment produced by decomposition of a glucoside (indigo leaves, camomile).

The author has endeavoured to find a hair dye which is non-toxic and which will impart various shades from blonde to dark brown. He has evolved one composed of a stable solution of chloride of bismuth used in combination with a solution of thiosulphate of soda. This dye will impart colour that has a natural appearance of the original shade of brown. It is a progressive dye—that is to say, the darker colours are gradually produced as the use of the dye is continued. Bismuth was chosen as it is a drug largely used and experience has shown that even when used by injection in large quantities untoward results are very rare. When applied to the unbroken skin it does not appear to produce ill effects. No unpleasant reactions have been observed in any of the cases investigated.

REFERENCES.—¹*Brit. Med. Jour.* 1933, i, 999; ²*Med. Jour. and Record*, 1933, May 17, 404.

CYSTITIS. (See BLADDER, SURGERY OF.)

CYSTS AND FISTULÆ. (See also COCCYGEAL SINUS; MESENTERIC CYSTS; PILONIDAL SINUS.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

E. C. Cutler and R. Zollinger¹ recommend the use of sclerosing solutions for the treatment of these conditions. The solution recommended is **Absolute Alcohol** 6 c.c., **Chloroform** 3 c.c., **Glacial Acetic Acid** 1 c.c., and **Ferric Chloride** 1 grm. It has the qualities of moderate penetration with rapid local fixation of the lining cells and excellent hæmostasis. It practically 'tans' tissues, much as tannic acid when used in the treatment of burns. Gliomatous cysts, cervical fistulæ, and pilonidal sinuses have been treated successfully. In one case of pilonidal sinus the tract was opened and the cavity was packed with vaseline gauze. Three days later the edges of the wound were protected with zinc oxide and the cavity was filled with the sclerosing solution for ten minutes. A week later the process was repeated, and in a month the wound

was entirely healed. In a second case the solution was injected into the sinus for five minutes. This distended a large cavity which extended to the right of the midline. The cavity held 10 c.c. of the solution. A similar injection was given the next day and twice again for ten minutes during the next two weeks. The destroyed tissue was frequently curetted away and a drain was inserted. The wound eventually healed completely. [It would appear from the case reports that the injection of sinuses or the application of the solution to the wound when the sinus is laid open results in permanent healing.—W. I. de C. W.]

In conclusion, the writers point out that surgeons who try to dissect out cervical fistulae which originate in the tonsillar pillar and run backwards to open just above the sternoclavicular joint know the Herculean task they impose upon themselves and their patients. The successful use of a chemical substance without risk to the patient and without the disfigurement of a scar suggests that this method should have much wider application. It is, of course, in the field of small fistulae with a lining membrane not more than a few cells deep that the method will find its greatest usefulness.

REFERENCE.—¹*Amer. Jour. Surg.* 1933, March, 411.

DEAFNESS DUE TO NOISE. (See NOISE.)

DEFORMITIES.

E. W. Hey Groves, M.S., F.R.C.S.

A New Type of Osteotomy.—The ordinary operations for osteotomy are open to certain drawbacks, such as a want of precision or a liability to non-union. Probably these are more theoretical than practical, but Klapp's suggestion described by Bengen¹ is worth consideration. It consists in making the division of the bone of a cup-and-ball type, the distal fragment being pointed and the proximal fragment recessed. There are two advantages in this. In the first place the bone, having been divided, can be fixed at any desired angle without losing good contact between the fragments. And second, the shape and size of the divided surfaces are such that rapid union will take place and the limb can be actively used at an earlier date than after the ordinary simple or cuneiform osteotomy (*Plates XIV–XVI*).

Paralytic Genu Recurvatum.—Exaggerated hyperextension of the knee may follow certain cases of poliomyelitis and will lead to a very ugly deformity and great instability. Willis Campbell,² encouraged no doubt by his success in stabilizing flail feet by a bone-block, has worked out and successfully practised a similar type of operation for the genu recurvatum of paralysis. The knee is opened from in front, after a Z-shaped division of the quadriceps tendon. The patella is bared of its cartilage, the lower end pointed, and then fixed to the upper surface of the tibia. When bony fusion has taken place the patella causes a locking of the knee in extension and prevents over-extension. (*Plate XVII*.)

Painful Heels.—The association of severe and intractable pain in the heels with the formation of bony spurs probably always points to the existence of a deep-seated inflammatory process of periostitis. Such a condition often occurs as a sequel of gonorrhoea. Treatment has always been a matter of difficulty. The excision of calcaneal spurs does not seem very rational as it only removes the results and not the cause of the disease. If excision cures the pain it is probably because the tension on inflamed fibrous tissue is removed. Now from two different sources, L. Pokorny³ and F. Liberson,⁴ comes the suggestion that the application of **Deep X-ray Therapy** is effective in curing the pain in this disease. The former author reports 2 cases and the latter 31 in which Roentgen therapy gave better and quicker cures than could be obtained by excision.

PLATE XIV

KLAPP'S OSTEOTOMY

(BENGEN)

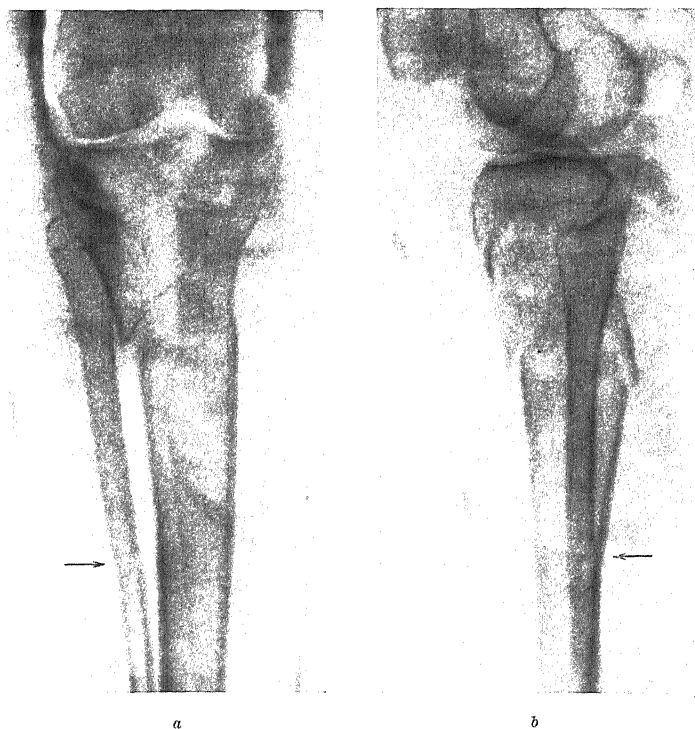
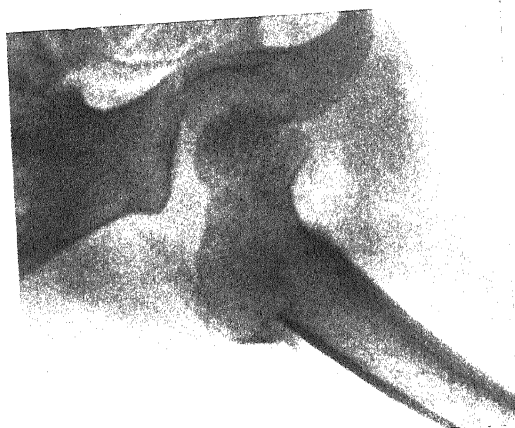


Fig. A.—Cup-and-ball osteotomy, giving a rotation of 50° . An evenly pointed osteotomy of the tibia has been performed through lateral and medial skin incisions. An oblique osteotomy of the shaft of the fibula has also been done. The slight backward curve of the tibia is due to weakness of the quadriceps. *a*, Antero-posterior view. *b*, Lateral view.

*Plates XIV-XVI by kind permission of
'Deutsche Zeitschrift für Chirurgie'*

PLATE XV
 KLAPP'S OSTEOTOMY—continued
 (BENGEN)



a
 Fig. 1.—Rachitic coxa vara. *a*, Before operation. *b*, After the performance of a cup-and-ball osteotomy.

PLATE XVI

KLAPP'S OSTEOTOMY—*continued*

(BENGEN)

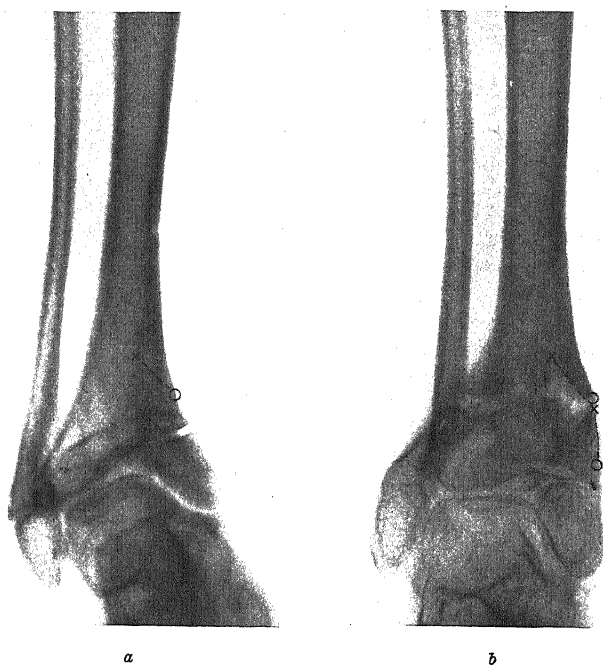
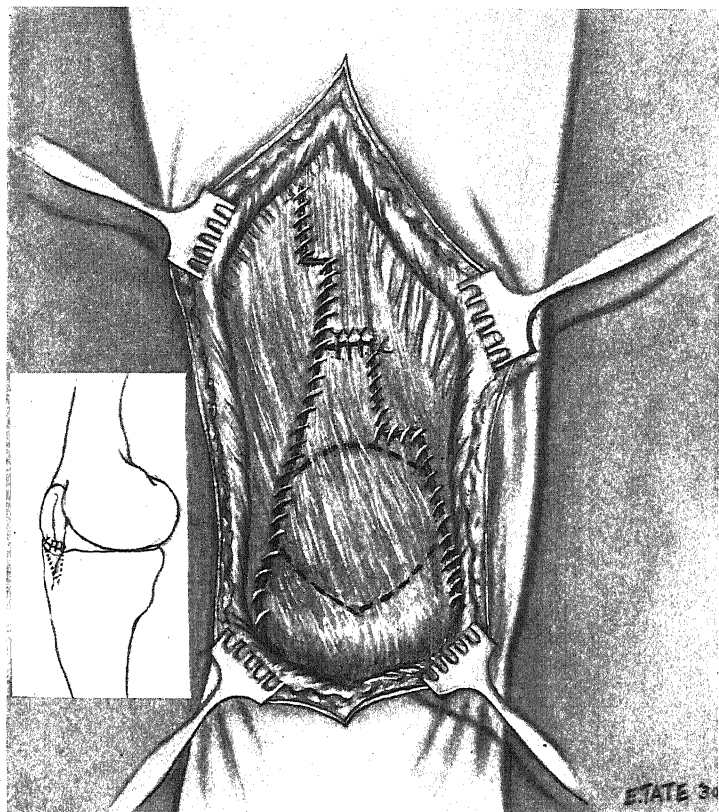


Fig. C.—Leg deformity. Actual shortening of 10 cm., together with calcaneus varus due to oblique position of ankle-joint. *a*, Before operation. X....) shows the direction of the medial chisel cut. *b*, After osteotomy. The cut surfaces of the bone have been separated from one another (lengthening). The line of the ankle-joint is horizontal.

PLATE XVII

PARALYTIC GENU RECURVATUM

(WILLIS CAMPBELL)



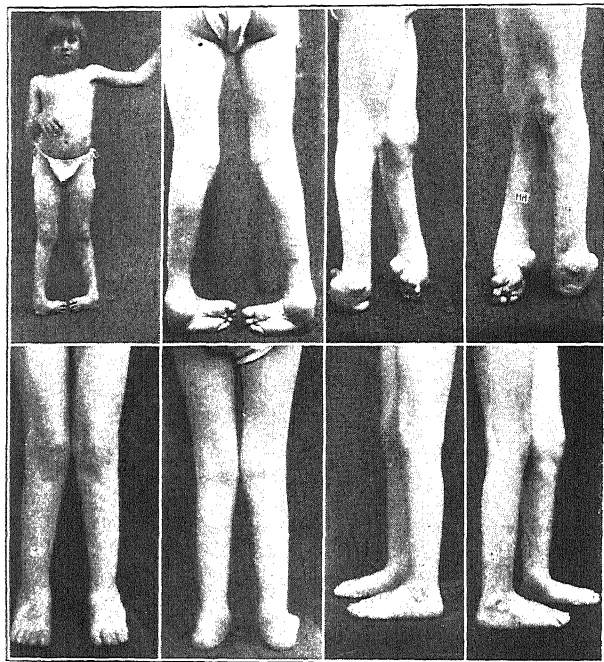
Method of suturing the quadriceps tendon after lengthening. The insert shows how the patella in its new position falls into the intercondylar notch to block extension of the knee-joint.

By kind permission of 'Annals of Surgery'

PLAT XVIII

CONGENITAL CLUB-FOOT

(J. H. KITE)



A seven-year-old girl with bilateral club-foot who had never been treated. The weight was borne on the lateral surface of each foot. None of the sole touched the ground, and the posterior foot was in marked equinus, so that the heels pointed upward. These feet were corrected without an anæsthetic or any kind of operative treatment. They were corrected by a series of plaster casts and wedgings as described in the 'non-operative' method. It is now two years since the treatment was completed, and the feet have held their correction.

*By kind permission of the
'Journal of the American Medical Association'*

Congenital Club-foot.—It is difficult to find any new method of treating these deformities. But it is important to emphasize certain principles which have been well-established, because in the search for something new and something dramatically quick, these principles may be lost sight of. It is for this reason that J. H. Kite's⁵ article on this subject is of such value. His chief contention is that non-operative methods give much better results than operative. This, of course, is no new idea and was constantly emphasized by Sir Robert Jones. But Kite brings forward very convincing evidence, and his methods in regard to conservatism go rather further than is usual. He finds that the method of treatment which gives the best results is that in which neither force nor anaesthesia is employed. The foot is corrected as far as possible, fixed by plaster, and then further correction is obtained by wedging. Two other observations are very interesting. This treatment required on an average over twenty-seven weeks. It is all done on out-patients and no stay in hospital is required, but the children are seen once or twice a week. There is no gain in beginning treatment before the age of 6 or 7 months, but it is of course essential to begin before the child has started to walk. Kite groups all his cases into three classes. In the first the treatment was on conventional lines, i.e., consisted of forcible wrenchings under anaesthesia, with various operations, e.g., tenotomies, fasciotomies. In the majority of these a good anatomic result was attained, but usually the foot remained rigid and inelastic and functioned badly. In the second class were those treated without any operation or anaesthetic, only by repeated plasters and wedging. In these the result was to produce feet which were both anatomically and functionally perfect—that is, the feet were not only of good shape but also soft and mobile (*Plate XVIII*). It is important not to be satisfied with anything which falls short of true anatomical correction, such as the stage shown in *Fig. 34*. In the third group, comprising only old or neglected cases, some form of wedge tarsectomy had to be performed. This produced a useful but never a normal foot.

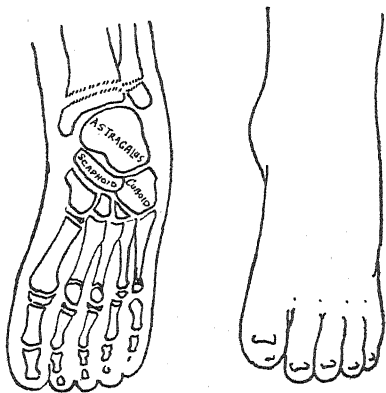


Fig. 34.—The relation of the scaphoid and the head of the astragalus after most of the fore-foot varus has been corrected by plaster casts and wedgings according to the non-operative method. The scaphoid is still somewhat to the medial side of the head. This foot is only apparently corrected. If weight were borne on it the weight thrust would still be to the lateral side of the foot, and the foot would be quickly forced back into its original position. (By kind permission of the 'Journal of the American Medical Association'.)

REFERENCES.—¹*Deut. Zeits. f. Chir.* 1933, Feb., 705; ²*Ann. of Surg.* 1932, Dec., 1055; ³*Jour. Amer. Med. Assoc.* 1932, Oct. 8, 1302; ⁴*Surg. Gynecol. and Obst.* 1932, Dec., 571; ⁵*Jour. Amer. Med. Assoc.* 1932, Oct. 1, 1156.

DERMATITIS MEDICAMENTOSA.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Phenolphthalein.—This drug, so largely used in laxative preparations, is well known to produce an eruption in sensitized individuals. The eruption is usually of the so-called 'fixed' type, showing itself by the development of purplish-red plaques in various parts of the skin and mucous membranes.

These lesions disappear when the drug is stopped, and tend to recur in exactly the same sites on re-administration.

F. Wise and M. B. Sulzberger¹ have carried out a series of observations in an endeavour to determine the site of sensitivity in cases showing this eruption. Patch tests to solutions of the drug were negative in all cases. Intracutaneous injections also gave no greater reactions than in control cases. From these experiments the authors conclude that neither the epidermis nor the superficial layers of the cutis are the seat of this form of hypersensitiveness. They then proceeded to remove an area of the skin which had been the site of a patch of the eruption, and on this site grafted a piece of skin which had escaped. The portion of affected skin was transposed to the area from which the normal skin had been taken. After the grafts had healed phenolphthalein was administered by the mouth. The rash appeared at all the previous sites, but the grafted normal skin now showed the eruption, while the previously affected skin which had been grafted on to a normal area now showed no eruption. The authors conclude from this that neither the epidermis nor superficial cutis (or both) is the 'shock site', and that the experiment seems rather to favour a theory of regional hypersensitiveness dependent on the deeper structures (nerves, blood-vessels). They note, however, that Naegeli performed similar experiments in the case of antipyrin eruptions with exactly opposite results.

They further describe a method for the demonstration of phenolphthalein in the tissues and body fluids, which is one of the most sensitive *in vitro* methods available. This, however, failed to disclose the drug in the urine and the affected tissues in a patient sensitive to the drug and having a typical eruption present.

They point out that this drug may be ingested in many ways besides in the well-known laxative preparations, such as in pink mouthwashes, tooth-pastes, sodium perborate preparations, and even icing on cakes.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1933, April, 549.

DERMATITIS VENENATA. A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Rubber Gloves.—J. J. Downing¹ has made some interesting observations on a dermatitis of the hands in persons wearing rubber gloves. It has been known for a long time that in persons liable to dermatitis of the hands the wearing of rubber gloves may exacerbate the condition owing to the sweating produced. Also when gloves are worn to protect the hands from known irritating substances care is not always taken to prevent these substances from getting into the gloves. The author first met with the condition he describes in three men who wore rubber gloves at their work during the whole day, but beneath them wore cotton gloves. These usually shrunk with washing so that they did not quite reach to the wrist. In all cases the dermatitis was marked on the anterior surfaces of the wrists, where the rubber came in contact directly with the skin. Other cases then came to his notice, and he tried patch tests with certain types of gloves, and positive reactions were obtained in all cases with one type of glove, but not with others. The reaction usually took seventy-two hours to develop. The author has investigated the method of manufacture of rubber gloves, and though not able to determine the cause of the dermatitis in his cases, gives a list of substances used in manufacture which he arranges according to their toxicity: (1) Highly toxic or irritant: aniline, hexamethylene-tetramine, ortho-toluidine, paraphenylene-diamine, para-toluidine. (2) Slightly toxic or irritant: alpha- and beta-naphthylamine, methylene aniline. (3) Non-toxic with proper handling: aldehydammonia, diorthotolyl-thiourea, heptaldehydeaniline, methylene-diphenyl-diamine, thio-carbanilide. (4) Non-toxic: dimethylammonium-dimethyl-dithiocarbonate,

diorthotolyl-guanidine, diphenyl-guanidine, ethylidine aniline, mercapto-benzothiozole, (captax), piperidonium penta-methylene dithiocarbonate.

E. D. Osborne and E. O. Putnam² also describe 15 cases of dermatitis due to wearing a particular brand of rubber glove.

Wool.—L. W. Lord³ describes 4 cases in which wool appeared to be the cause of cutaneous reactions. Two cases were urticarial in type and two eczematous. Three out of the four cases gave positive intradermal reactions to wool extract, and in all four cases exacerbations were produced by the application of wool to the skin. In two cases desensitization was produced by graded injections of wool extract.

Celery.—S. A. Henry⁴ has investigated 22 cases of dermatitis occurring during the autumn of 1932 in factories engaged in canning celery. Of 548 persons employed, 22 suffered from dermatitis (4 per cent). The process consists of cutting off the tops and outside stalks of the celery; preliminary washing in warm water, trimming, sorting, blanching with steamed water containing a little citric acid, further washing in warm water, and cutting; canning, sealing, and packing. The dermatitis was of the erythematous, vesicular, or papular type, and associated with itching, which has given rise to the name of 'celery itch' among the workers. It was confined to the lower half of the upper limbs, and was bilateral in over 80 per cent of the cases. Celery oil contains limonene, which was shown by S. Horner to be the cause of dermatitis in marmalade workers (see MEDICAL ANNUAL, 1933, p. 126). The author recommends transferring affected individuals to other work, and as a preventive smearing the hands with a very pure **Liquid Paraffin**.

Poison Ivy.—H. M. Cooper⁵ states that he has for many years immunized patients sensitive to poison ivy (*Rhus toxicodendron*) by giving them a small leaf of the plant to eat. Care must be taken not to touch the skin while eating the leaf. It produces no reaction nor any gastric disturbance. Three days after taking it the patients can "grab it out of fence corners with no more concern than they would have for any other common weed." He says he has used the method several hundreds of times without failure. He claims no originality for the treatment: it has been the practice thus to immunize workmen in Fairmont Park, Philadelphia, for years.

REFERENCES.—¹*New Eng. Jour. Med.* 1933, Jan. 26, 196; ²*Jour. Amer. Med. Assoc.* 1932, Sept. 17, 972; ³*Arch. of Dermatol. and Syph.* 1932, Oct., 707; ⁴*Brit. Jour. Dermatol. and Syph.* 1933, July, 301; ⁵*Med. Jour. and Record*, 1932, Oct. 5, 297.

DIABETES.

W. Langdon Brown, M.D., F.R.C.P.

ETIOLOGY.—M. Chiray and others,¹ in an interesting discussion on the association between cholecystitis and diabetes, point out that statistical inquiries into the frequency of gall-bladder infection in established diabetes, and of the frequency of diabetes following on gall-bladder infections, do not lead to any clear conclusion. That gall-bladder infections often show some chronic inflammation at the head of the pancreas is true, but the cell-islets are more abundant in the body and tail of the organ, and glycosuria is not a common accompaniment of pancreatitis confined to the head of the gland. When the two conditions of cholecystitis and diabetes coexist the authors incline to the view that they are two different expressions of hepatic dysfunction, and they issue a caution against systematic ablation of the gall-bladder if calculi are not present, merely with the idea of thus reducing the chance of a patient subsequently developing diabetes, as has been recommended by some authorities.

S. K. Krapavin,² of Moscow, states that diabetes occurring as a result of syphilis is not frequent—one writer reports 7.8 per cent of some 500 cases of

diabetes—but describes one instance in a patient heavily infected with syphilis, whose diabetes did not improve on insulin and diet until antisyphilitic treatment was also employed.

K. Eisenbud³ attributes the onset of diabetes to fatigue of the cell-islets induced by a persistent and excessive carbohydrate intake. Structural changes in the pancreas are a later development. He rejects any theory of neurogenic origin, pointing out that in Germany there was less diabetes during the War, in spite of much nervous tension.

PATHOLOGY.—

Lipemia.—D. H. Collins,⁴ using Ruckert's hæmolipokrit method for estimating fat in blood, confirms the view that an increase in serum fat is associated with the clinically severer cases of diabetes, although no clear relationship can be established between the serum-fat and blood-sugar level. He regards the lipemia of diabetes as solely dependent on the inhibition of carbohydrate metabolism, and as representing a mobilization of fat in response to the caloric requirements.

I. M. Rabinowitch,⁵ from a long series of observations, confirms his earlier impression that a normal cholesterol content in the blood plasma indicates that the metabolism is under control, and that the prognosis is favourable. He quotes Joslin to the same end, who even thinks that cholesterol is a more consistent guide to the patient's real condition than the blood-sugar.

Other Blood Changes.—R. D. Lawrence and others⁶ have established as a new fact that there is a rise in the colour index of the blood in diabetic coma, due apparently to a true megalocytosis excited in the bone-marrow by severe ketosis.

Normal Renal Threshold.—R. A. Campbell and others⁷ find that the renal threshold for dextrose varies in normal persons between 99 and 228 mgrm., but that in 80 per cent of cases it lies between 140 and 190 mgrm. They found it impossible to produce an alimentary glycosuria in some normal people.

INSULIN.—H. P. Himsworth,⁸ as the result of a study of irregularities in the response to insulin, puts forward the interesting hypothesis that insulin is secreted by the pancreas in an inactive form, which is rendered active by a kinase in the liver, on the analogy of the activation of trypsinogen by enterokinase. He points out the impaired activity of insulin in the presence of hepatic disease. This recalls the fact that several observers, particularly in France, regard the glycosuria of later life as more probably hepatic than pancreatic in origin. One might suggest that the delay in the normal response to insulin which characterizes the 'lag' curve may be due to delay in such activation. He finds that feeding with fat limits the production of insulin-kinase and thinks this may throw light on the relationship between glycosuria and obesity. He also suggests that some of the features of the coma syndrome are really due to hepatic insufficiency. The whole conception is one which stimulates interest.

F. N. Allan and L. R. Scherer⁹ have made a statistical study of insulin allergy in the Mayo Clinic, and find that, for some unknown reason, it is on the increase. They recommend in such cases first trying to control the diabetes by diet alone if possible. If this cannot be done, change the preparation of insulin used. If reactions still occur, an attempt should be made to desensitize by minimal dosage, gradually increased. Their work suggests the inadvisability of giving insulin intravenously to patients admitted in coma, for fear of anaphylactic shock.

Oily preparations of insulin have been recommended by Leyton in order to obtain a more prolonged and steady effect. H. Chabanier and others¹⁰ advocate their use, despite occasional local discomforts, but Marcel Labbé and others¹¹ definitely sum up against the preparations at present available,

maintaining that they are more difficult and uncertain in use than aqueous solutions. P. Bayer¹² was not impressed favourably by the treatment, and her patient even less so.

Crystalline insulin has now been prepared in a pure form, but J. E. Howard and Agnes de Lawder¹³ find no advantage in its use over that of commercial insulin.

Undoubtedly it would be an enormous advantage if some form of insulin could be found capable of effective oral administration. **Phaseolan**, a vegetable substance resembling insulin, has been advocated, and on the analogy of ephedrine, the adrenalin-like action of which can be produced when given by the mouth, seemed a promising idea. H. O. Hartleb¹⁴ has, however, not been much impressed with the results.

SYMPTOMS.—*Temporary visual disturbances* have frequently been recognized in diabetics coming under treatment, quite apart from the serious organic diseases of the eye to which they are liable. Duke-Elder in 1925 attributed these to changes in the blood-sugar, a rise producing myopia and a fall hypermetropia, through alteration in the crystalline concentration in the ocular fluids. This would account for the reviewer's experience that such disturbances have been commoner since insulin was introduced, since this readily alters the blood-sugar level. H. P. Himsworth¹⁵ has found them in 34 per cent of cases, and points out that such brief disturbances of vision, especially in the young, may lead even in the absence of all other symptoms to the detection of diabetes. They do not occur in other forms of glycosuria.

PROGNOSIS.—R. N. Klemmer,¹⁶ analysing 312 consecutive cases of diabetes treated in hospital by 47 different physicians over a period of eight years since the introduction of insulin, found a mortality rate of 13.5 per cent in the medical, and 15.2 in the surgical cases.

TREATMENT.

High Carbohydrate Diet in Diabetes.—It is extraordinary, when an entirely new therapeutic measure is introduced, to note how slowly all its implications are realized. For years after the discovery of insulin, patients were kept on a diet rich in fats, and poor in carbohydrates. J. A. Nixon was one of the first in this country, as was Rabinowitch in Canada, and Adlersberg in Vienna, to realize that we were being still held in thrall to the older conceptions of the disease. D. Adlersberg¹⁷ has recently returned to the attack, and finding that in France the low carbohydrate diet was being almost exclusively advocated, insisted on the advantages of a diet poor in fat, but comparatively rich in carbohydrate, since this alone will lead to effective metabolism of the non-nitrogenous food stuffs. S. C. Dyke¹⁸ had shown also that this plan might enable the insulin dosage to be reduced; and adopting his method, the reviewer was able to lower the dose in a child of 11 from an average of 30 units in the morning, and 7 in the evening, to one daily dose of 14 units.

At a discussion at the Royal Society of Medicine in 1931 there was a general consensus of opinion in favour of the higher carbohydrate diet, and G. Graham and others,¹⁹ reviewing his 'pedigree' cases which had been under observation at St. Bartholomew's Hospital since 1924, found that distinctly less insulin was required proportionately for a larger amount of carbohydrate. Unlike Adlersberg, Graham does not attribute this to a lower caloric value in the diet. Animals have been shown to be less sensitive to insulin on a diet containing much fat but little or no carbohydrate. Attempts to push up the caloric value of a diet by giving much fat should therefore be abandoned. Apart from the risk of acidosis, the efficiency of insulin is reduced thereby.

L. H. Newburgh and D. S. Waller²⁰ find that an advantage of increasing the

carbohydrate in the diet is that the efficacy per unit of insulin steadily rises from being sufficient for 1.4 gm. of dextrose to 7 gm. when the carbohydrate intake exceeds the limit of tolerance by 100 gm. Beyond this point no further increase in efficiency occurs. S. Strouse and S. Soskin²¹ maintain that since insulin-treated patients do equally well on widely differing diets, the objective should be to meet the dietetic demands of an individual leading a full normal life, and give enough insulin to balance it.

Bang favours the high carbohydrate diet, as does A. Filippini²² in a critical review of the literature of the subject, while R. D. Lawrence²³ has modified his Line Ration diet by increasing each carbohydrate ration from 5 to 10 gm., and by allowing certain other modifications as required by the individual case, such as reduction in the amount of fat.

High Carbohydrate Intake in Coma.—H. P. Himsworth²⁴ in making a strong plea for giving large quantities of **Dextrose** in impending or established coma, shows that small doses of insulin are really more effective with plenty of dextrose than are large doses with a smaller intake of dextrose. He maintains this plan until there is hardly any acetoneuria, and points out the danger of hypoglycæmia as the patient emerges from coma if large doses of insulin are being employed. He makes the rather surprising but interesting claim that a rise of blood-sugar is compensatory in this condition and therefore need not be feared. He consequently regards the blood-sugar as a fallacious guide. Herein he is supported by A. Sebastiani,²⁵ who emphasizes the lack of parallelism between the hyperglycæmia and the glycosuria, and prefers to rely on the general clinical condition rather than on repeated blood-sugar estimations.

The only objection that the reviewer has heard against high carbohydrate diet is that if large doses of insulin are already being given, there is nothing in reserve in case of an acute infection. But in view of the increased efficiency of insulin when the carbohydrate intake exceeds the tolerance by 100 gm., this can hardly be a practical objection. To a large extent by this new method the picturesque phrase is justified that the diabetic is 'delivered from calories'.

Diathermy in Diabetes.—Since diathermy has been shown to be capable of increasing the activity of many endocrine glands, Z. Rausch²⁶ applied it to twelve diabetic patients, and concluded that it raised carbohydrate tolerance in mild cases, and to a less extent in severe ones. The best results were obtained when an electrode of 60 sq. cm. was applied over the pancreas combined with one of 100 sq. cm. over some other area of the abdomen. The intensity of current should be raised to a point of maximal heat tolerance and the duration of treatment should be half to one hour.

Galactose in Diabetes.—W. G. Kerr and T. V. Letonoff²⁷ find that galactose disappears very quickly from the blood of diabetic patients and appears to be readily stored as glycogen in the liver. Its removal from the blood-stream is not aided by insulin. It does not appear to be really useful in the treatment of diabetes, however.

DIABETES IN CHILDHOOD.

It is generally admitted that diabetes is a very grave disease in early life, and that few children survived more than two years in the pre-insulin days. Joslin found that even in the first four years after the introduction of insulin 11.5 per cent had died. G. B. Fleming,²⁸ reviewing his own experience since those days, considers that though infection remains the most dangerous complication of diabetes in childhood, it is seldom an important etiological factor. Heredity seems to be of more importance. Ketosis, whatever the cause, produces a diabetic blood-sugar curve (M. L. Gilchrist²⁹), and meningitis may excite a glycosuria—points to be borne in mind in making the diagnosis.

Most deaths occurred in coma in the second decade, which the author thinks may be connected with the child breaking away from maternal control.

TREATMENT.—N. Morris³⁰ discusses two alternative methods of treatment : (1) An initial low diet, gradually worked up, with the addition of insulin as soon as glycosuria recurs ; (2) An optimum diet from the first, with sufficient insulin to deal with the carbohydrate. When there is marked ketonuria he favours the second method, since coma is so easily precipitated in childhood, but otherwise he prefers the first, claiming as advantages : (a) the carbohydrate tolerance can be determined ; (b) glycogen storage is assisted, and the risks of subsequent hypoglycæmia reduced ; (c) overfeeding, and therefore too rapid an increase in weight, is avoided. There is no evidence in favour of delaying insulin injections in childhood, and it is rarely possible in his experience to do with only one injection daily. Like other observers, he is struck with the liability of the blood-sugar to rise during the fasting hours of the night. He is in favour of keeping the urine free from sugar if possible, though admitting, as others have found, that the child often does not feel so well if there is not some morning glycosuria. Hypoglycæmia he regards as not so dangerous as persistent underdosage of insulin. Muscular exercise calls for a reduction of dose, since only very severe diabetics fail to react to exercise by the lowering of blood-sugar. The occurrence of digestive disorders, by delaying the absorption of food, may cause hypoglycæmic attacks. Even slight infections, such as an ordinary cold, call for an increase of insulin, which should be reduced again as soon as the active infection is over.

F. J. Ford³¹ emphasizes the factor of dehydration in diabetic coma, which calls for urgent treatment, orally, rectally, and, if necessary, intraperitoneally or intravenously. He gives 10 to 15 gm. of sodium bicarbonate every four hours to increase the alkaline reserve, despite Joslin's opinion to the contrary, while glucose is given together with insulin. Since 1924 he has had 8 cases of coma with only 1 death, which occurred in a patient who had been comatose for four days prior to admission.

P. Maurel's³² review of the subject comes to very similar conclusions to those of the Glasgow school. Everyone agrees that the prognosis of the disease in childhood has been enormously improved by insulin, but that there is no evidence of recovery of carbohydrate tolerance ; rather is there a gradual diminution. It is therefore too early to speak of the ultimate prognosis, since no one's experience of insulin exceeds eleven years.

(See also HYPOGLYCÆMIA.)

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DIARRHŒA, ACUTE, AND VOMITING IN INFANTS.

Reginald Miller, M.D., F.R.C.P.

A. Moncrieff,¹ who deals in detail with the treatment of this condition, makes the preliminary point of the necessity of excluding those cases in which the alimentary symptoms are merely secondary to disease elsewhere. Of the primary cases he recognizes three groups : (1) Due to bacterial infection ;

(2) Due to alimentary irritation by food, a dietetic disturbance; and (3) Due to an acute upset following prolonged indigestion.

TREATMENT.—Moncrieff gives four general principles underlying all remedial measures: the child must be treated as a whole and all attention must not be focused on the frequency and character of the stools; skilled nursing is essential; a short period of starvation is necessary in every case; and infectious precautions as in typhoid fever should be observed in all cases, especially in the dysenteric group with blood and mucus in the stools.

In infants, with the profound disturbance of water retention, the preliminary starvation period of twelve to twenty-four hours must be occupied by the administration of copious quantities of **Fluid**. This may be given by the mouth from a bottle in the form of half-strength normal saline at frequent intervals whenever the child is awake. If vomiting is a marked feature, the fluid should be given cold. In some cases as much as two pints of fluid can be administered in twenty-four hours, but often in severe cases the baby is too weak to suck properly or fluid is constantly rejected by the mouth, and recourse must be had to other routes. The subcutaneous route should be tried first, and the complicated methods adopted in hospitals can be abandoned in favour of the simple use of a large metal syringe (such as that used for syringing ears) to which a big hollow needle is attached by rubber tubing. With aseptic precautions this method can be used to inject normal saline at a temperature of about 105° into both flanks, about 10 to 15 c.c. per pound of body weight being the ideal quantity, to be repeated every six hours according to the rate of absorption. Intraperitoneal injection of saline is also valuable in getting fluid rapidly into the system; about half a pint of normal saline at 100° should be thus introduced and repeated as required. The intravenous route is very difficult in small babies with collapsed veins, and should be attempted only by those fully accustomed to it. This applies especially to the injection of fluid into the longitudinal sinus. Blood transfusion is definitely contraindicated in most acute cases. In dysenteric cases in young babies, the use of the Lister Institute mixed **Anti-dysenteric Serum** in doses of 5 to 10 c.c., intramuscularly, repeated as required, is recommended.

The elimination of toxic substances in the bowel should be the next step. A dose of **Castor Oil** (1 drachm as a minimum) has much to recommend it, despite the fact that peristalsis is already active, because of its after-effect of inducing constipation. The lower bowel and stomach should be gently washed out with a weak solution of sodium bicarbonate or with **Normal Saline**, some of which latter can be usually left *in situ* as extra fluid. Collapse should be met by a **Mustard Bath**, and stimulants such as **Camphor** (5 min. of a 1-20 solution in olive oil) or **Adrenalin** are recommended. **Brandy** is of doubtful value, at any rate in the small doses usually urged, but its use is expected by the parents and it is probably politic to give 30 min. at once in water and repeat in smaller quantities every two to four hours.

Drugs are disappointing; antiseptics have little to recommend their use, but **Calomel** in small doses is probably the best. When the large bowel is mainly involved, as in the dysenteric form, **Bismuth** is of definite value and should be pushed to secure constipation. **Opium** is valuable when the acute stage of dehydration is over, and there are repeated loose motions associated with a clean tongue. Under six months of age, the dosage of the tincture of opium is about $\frac{1}{4}$ to $\frac{1}{2}$ min., and after that age should be gradually increased up to 1 min. at a year old (i.e., the dose in minims roughly corresponds to the age in years). The restless baby should be given sufficient chloral to ensure quiet (gr. $\frac{1}{2}$ in water four-hourly for the baby of six months).

When the acute phase is over, and at the end of the period of starvation,

comes the difficult stage of returning to a suitable **Diet**. The ideal is undoubtedly to use diluted human milk, but this is not usually obtainable in this country unless the infant has been breast-fed. It is generally agreed that fat must be kept low, protein given gradually, and the sugar used non-fermentable. It must also be remembered, as mentioned above, that the gastric acidity is usually definitely lowered, and that the choice of artificial food is therefore limited to a skimmed dried milk with the addition of dextri-maltose, or to lactic acid skimmed milk; this is made by taking one pint of boiled skimmed milk and half a pint of boiled water and adding 60 min. of B.P. lactic acid, drop by drop, stirring well; it must not be heated above body temperature or it will curdle. Sugar in the form of dextri-maltose can be added as required. The first feed should be small in quantity (1 to 2 oz.) and very dilute, and additions of quantity and strength must be made very gradually. Half-cream dried milk forms a useful stepping stone between the skimmed-milk régime and the return to a full-cream milk. Ordinary cow's milk is best avoided for some time, and all additions of fat to the diet, such as cream or cod-liver oil, must be prohibited. Vitamins A and D can be administered in concentrated forms.

REFERENCE.—¹*Practitioner*, 1933, March, 307.

DIETETICS. (See also VITAMINS.)

Ivor J. Davies, M.D., F.R.C.P.

The teaching of dietetics in ordinary medical education has been largely neglected, as R. Hutchison¹ pointed out in the first edition of his book *Food and the Principles of Dietetics*. This authoritative work has now reached its seventh edition and has been brought thoroughly up to date. The new edition has been prepared with the collaboration of Professor V. H. Mottram, and presents a most readable and practical account of the subject.

J. S. McLester² has rightly observed that in few departments of medicine are such rapid strides being made as in the science of nutrition. Animal experiments and clinical observation constantly reveal new facts which have led to improved methods of feeding both in health and disease. The study of vitamins and the great public interest aroused by the publication of the reports of the Medical Research Council have had far-reaching effects. A widespread interest in diet has now been formed, resulting in more and more care being taken in this branch of therapeutics. No mode of treatment has ever met with such a ready response from the patient as that which followed the application of recent knowledge of food-values. It may be fairly stated that no measure of treatment is likely to establish the regular practitioner so securely as the general adoption of these principles of dietetics. The public has been widely informed in well-written articles in the press and expects the general practitioner to apply this new knowledge in its interest. The time has passed when we can afford to dismiss the question of diet with some vague general statement.

Dietetic Treatment in Hospitals: Appointment of Dietitians.—The establishment of dietetic kitchens in many of the London and provincial hospitals is one of the most important innovations in recent times. These departments for the control of dietetic treatment are in charge of a dietitian, who is responsible for the calculating, planning, and cooking of the special diets throughout the hospital. The whole work of the kitchen, including the actual cooking, is done by the dietitian and her students and a few nurses who are sent in turn for special instruction. The department deals with each patient individually, and no new diet is served until the patient has first been visited by the dietitian personally. Diets are ordered by the physician or surgeon, and, if to be weighed, in grammes of carbohydrate, protein, fat, or

calcium, etc. The sisters send a requisition form to the diet kitchen daily, with a list of diets required, the name and bed number of the patients, and any special requests as to likes and dislikes, etc., which can safely be allowed.

Thus the main responsibility for the feeding of patients on special diets is transferred to the dietitian, who works under the direction of a member of the medical staff and whose special training fits her for the construction of the more specialized diets. In practice, a close co-operation has been formed between the nursing staff and the dietitian, and the final success of the innovation has thus been secured.

The meal for each patient is prepared separately and also served in an attractive manner on separate trays. The diabetic diet is planned so that it is as near as possible to that which the patient will be having at home. The patient is instructed in the weighing of his separate articles of food, and whoever is responsible for the preparation of the food on the patient's return home is interviewed by the dietitian whenever possible. Each patient on discharge receives full instructions, together with lists of alternative foods and recipes. He may be instructed in the self-administration of insulin, and is made to understand the absolute necessity for strict dosage, and to recognize the early signs of an overdose. He is warned never to be without a few lumps of cane sugar.

The dietitian attends 'Out-patients' daily, and in a room of her own sees patients referred to her by the physician or surgeon. This branch of the work offers great scope, as a far larger number of cases can be seen and thus the necessity for admission is often obviated. The work in the out-patient department, from the point of view of the patient, reminds the writer of the sympathetic and very useful rôle played by the 'V.A.D.' in the War. In addition to the dietitian's special training, the personal factor is paramount. The friendly and rather informal character of the work should always be maintained. It is noticeable that the out-patient leaves the department with an intelligent understanding of his particular list of foods and convinced of the necessity for strict observance. The dietitian gains the interest of the patient in his own cure, and makes him feel in part at least responsible for its success. We have not previously shared the nature of any treatment to the same extent as is now done in the matter of dietetic control. On an average, about half an hour is allotted to each patient, and his ordinary meals are made a basis for the construction of the special diet. The physician prescribes the number of grammes of carbohydrate, protein, and fat, if a diabetic diet, or the number of calories, if a reducing diet, and the details are left to the dietitian for elaboration.

Weight reduction offers much scope to the dietitian. On a diet of about 1000 or 1200 calories, the loss is usually 1 to 2 lb. a week, or about 14 lb. in three months, when the diet can be raised to a maintenance level for a short time. The course can be repeated once or twice afterwards. Highly satisfactory results are obtained in the alimentary type of obesity, through mild restriction of diet and regular exercise, without the aid of thyroid therapy.

These particulars serve to illustrate the duties of the dietitian. It will be seen that far better results are now possible than by the former vague mode of dieting. I am much indebted to Miss A. Abrahams, Dietitian at St. Bartholomew's Hospital, London, her assistant Miss Jean Ferguson, Miss E. M. Marshall,³ Dietitian at University College Hospital, Miss Rose Simmons, Dietitian at the London Hospital, and Staff-Nurse Wheeler of King's College Hospital, for the opportunity of seeing the work of their departments in every detail.

Consumption of Carbohydrates.—J. H. P. Paton⁴ (St. Andrew's), in a paper on the national consumption of carbohydrates in relation to disease,

draws the following conclusions. Modern consumption of carbohydrates is excessive, and this excess is largely the result of the addition to our diet of steadily increasing quantities of cane sugar. There is considerable clinical evidence that this excess is producing harmful effects in several directions. It affords some explanation of the high rate of incidence of severe catarrhal affections, of the frequency of acidosis in the modern child, of the prevalence of rickets and dental caries, and of the increasing death-rate from diabetes and cancer. Excess of glucose absorption is probably one etiological factor in the production of diabetes, and may be an accessory factor hastening death in malignant disease. Excess of carbohydrate in the diet has, it would seem, so modified the 'soil' that the prevalence of certain disease states is increasing. The considerations advanced suggest that restriction in the intake of carbohydrates and especially of cane sugar, with the substitution of more animal fats as sources of energy and of fresh natural food-stuffs in our diet, would result in definite improvement in the standard of national health.

Cod-liver Oil.—In an annotation the *British Medical Journal*⁵ refers to a communication by J. Kloster⁶ on the harmlessness of cod-liver oil in bulk. He studied the effects on the health of drinking large quantities of cod-liver oil over a long period. He was stationed for two years in the extreme north of Norway, where no corn and only small quantities of potatoes are cultivated. On six or seven days in the week fish is eaten at two or three meals, and it is supplemented by a daily ration of about half a litre of 'mölje' (liver and liver fat) for adults in the busiest fishing season. During the six winter months 30 to 40 grm. of cod-liver oil are consumed per day and per head. He was struck by the good nutrition of the infants and young children in his district; this was the more remarkable as the lives they led in dark rooms during the long, dark winter were in many respects unhealthy.

Halibut-liver Oil.—R. T. M. Haines and J. C. Drummond⁷ (London) investigated the properties of halibut-liver oil. Considerable interest has been shown recently in halibut-liver oil as a source of vitamin A and vitamin D for use in the treatment of malnutrition, and there is no doubt that the product is already proving of great value in the hands of the medical profession. The liver of the halibut (*Hippoglossus hippoglossus* Linnaeus) may show considerable variation in the amount of oil present, but of greater significance is the curiously wide variation in vitamin A value which is encountered. Lovern⁸ and Heilbron and others⁹ have drawn attention to these differences, for which, as yet, no satisfactory explanation has been advanced.

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DIPHTHERIA.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—The tenth annual report of the *Journal of the American Medical Association*¹ on the diphtheria mortality in the ninety-three cities of the United States with a population of 100,000 and over, shows that the diphtheria rate per 100,000 of population in 1932 ranged from 8.16 in the West South Central States to 2.53 in the Middle Atlantic States. Five cities did not register a single death from diphtheria in 1932. New York for the third year in succession reported a very low rate (2.9 per 100,000). Philadelphia had the best record (0.8) for any American city with a population of more than a million. The city of Camden had the highest rate (8.4), as it had in 1931. (See also MEDICAL ANNUAL, 1933, p. 139.)

BACTERIOLOGY.—In 1931 J. S. Anderson, F. C. Happold, J. W. McLeod, and J. G. Thomson,² of Leeds, described two forms of diphtheria bacilli, *gravis* and *mitis*, which, as they claimed, were associated with very severe and mild diphtheria respectively. On the other hand, H. J. Parish, E. E. Whatley, and R. A. O'Brien³ found no satisfactory evidence that the gravest types of diphtheria were generally associated solely or even mainly with the *gravis* type of bacillus, and maintain that the association of the *gravis* bacillus with severe attacks of diphtheria found in the Leeds area is merely a local phenomenon.

In opposition to the view held by some writers, H. Bernadou and P. Lamothe⁴ declare that, apart from some cases observed in infants, there is no pathological or clinical evidence that bronchopneumonia refractory to ordinary vaccines is due to latent diphtheria. Patients suffering from bronchopneumonia with diphtheria bacilli in their nasopharynx but without any clinical evidence of diphtheria should be regarded mainly as diphtheria carriers, the part played by the diphtheria bacillus being merely that of a saprophyte in such cases.

H. Preidt⁵ examined the ear discharge in children in a home for extrapulmonary tuberculosis and found diphtheria bacilli in 28 per cent, a result similar to that reported in 1921 by Davidsohn and Heck, who found the organism present in 38 per cent of their otitis cases. Although the virulence test was negative in the only two cases in which it was performed, Preidt thinks that one patient infected two children in adjacent beds who developed faucial diphtheria. It is advisable, therefore, to examine all children with otitis for diphtheria bacilli before their discharge from hospital.

SYMPTOMS AND COMPLICATIONS.—S. Veras⁶ reviews the literature of the last twenty-four years on *diphtheria of the vulva*, and reports a personal case in a girl, aged 2½ years, which was remarkable for the following reasons: (1) Diphtheria of the vulva is uncommon; (2) The vulvar lesion was primary, as the child had not had any sore throat, whereas genital diphtheria is almost always secondary to faucial involvement; (3) The lesion was not at first typical. Cultures, however, showed the presence of diphtheria bacilli, and rapid and uncomplicated recovery followed injection of antitoxin.

A case of post-diphtheritic *stenosis of the œsophagus* is reported by L. Kraus.⁷ The patient was a girl, aged 2 years, who ten days after a mild attack of diphtheria treated by antitoxin developed difficulty in swallowing. This was at first regarded as due to palatal paralysis, and was treated by faradization of the palate, but as no improvement ensued, œsophageal spasm was diagnosed, especially as X-ray examination revealed no marked change. When, however, antispasmodic treatment had no effect, and the condition had lasted for ten months, œsophagoscopy was performed, and showed a well-marked cicatricial stricture about 6 cm. long at the level of the bifurcation of the trachea. Treatment by œsophageal bougies was carried out, and considerable improvement took place.

According to E. H. Place⁸ the onset of *diphtheritic carditis* is from the sixth to the twenty-first day from the onset. In addition to pallor and coolness of the extremities and skin, the physical signs are changes in the heart-sounds and heart-rhythm. The first change is softening and shortening of the first sound. The diastolic pause is usually shortened. Rhythmic disturbance consists most commonly in the gallop type of three or four sounds, rarely flutter or fibrillation. There is a fall of blood-pressure. In the worst cases the liver becomes enlarged and tender. Electrocardiograms show two main types of damage—namely (1) auricular and intra-ventricular block, and (2) changes in the shape and direction of the T wave and reduction of the voltage of the heart current. The two changes may be associated or the second may occur

alone. The case fatality of diphtheritic carditis is between 50 and 60 per cent. Death may occur within twenty-four hours from the onset, but the average time is about three days.

The question as to whether *permanent cardiac damage* follows diphtheria or not appears to be still undecided. S. Alstead,⁹ from comparison of 150 cases having a history of diphtheria with 100 with no history of the disease, came to the conclusion that there was nothing to suggest the occurrence of gross cardiac lesions as the result of a previous attack of diphtheria. A. F. Hecht,¹⁰ on the other hand, who reports nine cases in children aged from 7 months to 9½ years, maintains that permanent damage to the heart after diphtheria cannot be excluded. He regards repeated electrocardiographic examinations as the only means of determining whether such changes have occurred and as the most reliable guide to prognosis. If a change in the electrocardiogram persists, true anatomical recovery is impossible.

P. von Kiss¹¹ found that 86 (5.9 per cent) of 1680 children admitted to hospital with diphtheria showed *hæmorrhages* in some form or another. The prognosis of epistaxis in purely nasal diphtheria is absolutely favourable, and when the disease is confined to the tonsils or conjunctiva, epistaxis is not a very grave sign, the fatality rate in such cases being 11.1 per cent. On the other hand, the prognosis of epistaxis in concurrent faucial and nasal diphtheria is very serious, the mortality in such cases being 44.5 per cent. Lastly, the prognosis is absolutely bad when the hæmorrhage in faucial diphtheria is not confined to a single system, or when it develops in diphtheria with multiple localizations of the disease. Toxæmia is mainly responsible for death in such cases, but in some instances cardiac involvement is the cause of death.

A case of diphtheria associated with *purpura hæmorrhagica* is reported by R. N. Howard.¹² The patient was a girl, aged 12 years, admitted to hospital with hæmaturia, numerous petechiæ on the skin, and a hæmorrhagic condition of the right tonsil which showed a few whitish specks. The red cells numbered 2,300,000 and the leucocytes 7600 per c.mm. No platelets were seen. Next day the patches on the tonsil had become confluent and yielded a pure culture of diphtheria bacilli. Three doses of antitoxin were given, and apart from otitis media recovery was uneventful. The case appears to have been one of diphtheria occurring in a purpuric subject rather than an example of hæmorrhagic diphtheria, as the child was not severely ill, nor were the faucial lesions extensive, as is the rule in hæmorrhagic diphtheria (cf. MEDICAL ANNUAL, 1932, p. 131).

S. Lavit,¹³ who records 26 cases in children aged from 3 to 11 years, states that *nephritis* is a frequent complication of diphtheria. Anatomically it is a localized parenchymatous nephritis, characterized by lesions of the convoluted tubules. Clinically its features are albuminuria, diminution in the amount of urine passed, and digestive and nervous disturbance of varying intensity. There are no signs of acidosis. The prognosis varies. In the renal forms of malignant diphtheria the nephritis forms part of the malignant syndrome and aggravates the prognosis, but is not necessarily always the cause of death. In mild forms the albuminuria is only transient. The lesions of diphtheritic nephritis never become chronic.

A. Brems¹⁴ investigated the *blood-sugar* in 25 diphtheria patients with the following results. In the acute stage a moderate increase of blood-sugar was fairly frequent. In severe cases administration of glucose by mouth in the acute stage was frequently followed by an abnormal blood-sugar curve due to a toxic disturbance in the regulation of blood-sugar. Two or three weeks after the last administration of glucose by mouth the blood-sugar curve becomes more or less normal again. In the acute stage of severe diphtheria glycosuria

often occurs spontaneously, and after the administration of glucose it is almost constantly present.

THE SCHICK TEST.—J. Greengard¹⁵ reports his observations on the Schick test in 584 children aged from birth up to the age of 3 years. In the first week of life the result was positive in 9 (17.6 per cent) out of 51 infants examined. There was then a progressive increase in the number of positive reactions, the highest incidence (70.6 per cent) being reached between 9 and 12 months. In the age group above 12 months, 69.8 per cent were positive. A few infants showed a loss of immunity as early as the first to third months of life, while in some the immunity outlasted the first year of life, and in a few instances 18 months. In a group of 100 mothers and their newborn infants on whom comparative tests were performed, the following lack of agreement was found between the reactions of the mother and that of her infant: 60 per cent of the newborn infants of positive mothers gave negative reactions, and in every case in which the infant's reaction was positive it was less intense than the mother's. All the infants of negative mothers also gave a negative reaction. Similar results were obtained by J. V. Cooke and B. M. Sharman¹⁶ in their comparative studies of Schick tests on mothers and their newborn infants.

PROPHYLAXIS.—The occurrence of diphtheria in spite of active immunization by anatoxin is described by J. Tomcsik,¹⁷ who reports that among 100,000 Hungarian children who had been given the regulation three injections, 102 contracted the disease at periods ranging from one month to three years after the last injection. In 75.5 per cent of the cases the character of the attack of diphtheria was mild, in 16.5 per cent moderately severe, in 1 per cent laryngeal, in 4.6 per cent a mixed infection, and in 2.9 per cent toxic and fatal. In each of the three fatal cases, which occurred in children aged 5, 7, and 8 years respectively, death took place more than a month after the last injection of anatoxin.

In a paper on immunity to diphtheria conferred by *tonsillectomy*, A. Topper and S. Leader¹⁸ refer to the paper by Schick and Topper (see MEDICAL ANNUAL, 1931, p. 153), who had shown that out of 151 children 123 (81.5 per cent) gave a negative reaction six months after the operation. They now report the results of 81 more children who were Schick-positive before tonsillectomy and were tested six months after the operation, when only 54 (66.6 per cent) were found to be negative. The smaller number of negative reactions than on the previous occasion is attributed to the decreased incidence of diphtheria in New York, and especially in the districts from which the children came. They conclude that tonsillectomy favours the development of immunity to diphtheria, but consider that as this development depends largely on the presence of diphtheria bacilli in the environment it is most likely to occur in congested districts where the incidence of diphtheria is high.

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DRUNKENNESS, TESTS FOR.

H. Devine, M.D., F.R.C.P.

A. Baldie,¹ who is a divisional surgeon for the Metropolitan Police, has written a valuable paper on the signs and symptoms of alcoholic intoxication, which provides the medical practitioner with information on this subject which he will find most helpful. Since motor traffic has developed, drunkenness has ceased to be merely a social offence. Formerly, drunk was drunk; the effect

on efficiency was hardly considered. Times have changed, and the question of alcoholic intoxication has developed a new significance reflected in legal enactments and by public opinion, and one which is more practical and utilitarian, less concerned with moral considerations of alcoholism *per se*, but none the less strict on this account.

Definition of Alcoholic Intoxication.—The Road Traffic Act, 1930 (Sect. 15), lays down: "Any person who when driving or attempting to drive, or when in charge of, a motor vehicle on a road or other public place, is under the influence of drink or a drug to such an extent as to be incapable of having proper control of the vehicle, shall be liable to penalty—the sense of the definition recommended by the British Medical Association Committee of 'drunkenness'". This definition was: "That the word 'drunk' should always be taken to mean that the person concerned was so much under the influence of alcohol as to have lost control of his faculties to such an extent as to render him unable to execute safely the occupation on which he was engaged at the material time".

This definition is a forward step from a medical aspect; but it brings the medical profession up against the admittedly difficult problems involved in the determination of occupational incapacity due to alcohol: the first, though not the most important, of which is the use of some accepted term to describe a degree of physical and mental inco-ordination due to alcohol, also accepted as amounting legally to incapacity. The word 'intoxication' is probably the most suitable to describe any state of occupational incapacity due to alcohol. It is a term of definite and scientific meaning; it is applicable in all the various classes of case in which any question of occupational incapacity, whether due to 'drunkenness', 'intemperate habits', or 'the influence of drink' arises; and it denotes, if necessary, though not necessarily, less severe degrees of inebriation than the word 'drunkenness'.

Stages of Intoxication.—Alcohol, like other anæsthetics, tends to produce its effects in stages, and these stages, irrespective of the amount or kind of liquor consumed, are:—

1. *The Stage of Exhilaration, Elation, and Expansiveness.*—In this stage timidity and restraint give place to bravado and recklessness. Discretion and reserve are replaced by genial and irresponsible loquacity; the individual seems sure, perhaps unduly sure, of his powers and importance.

2. *The Stage of Irritability and Confusion.*—Here efficiency in any form, whether induced or not, disappears, although effects vary a good deal. Inco-ordination is more or less pronounced, and the intellectual disturbance accentuates the motor incompetence.

3. *The Stage of Drowsiness.*—This stage is responsible for the arrest of many persons. Drowsiness may, of course, be due to many causes, physiological and pathological, as well as to intoxication by alcohol. The ease with which an individual, whether sick or well, and suffering or not from the effects of cold and fatigue, leaning back continuously in one position, hypnotized by the passing lights of a city, may doze, perhaps only momentarily, is greatly increased by an alcoholic factor.

Factors Influencing the Nature and Degree of Impairment of Faculties.—(1) The idiosyncrasy of the individual. (2) The power of temporary recollection and restoration of faculties. Many intoxicated persons are curiously able temporarily to reimpose their inhibitions in the presence of a sudden stimulus such as a fall, a cold-water douche, or legal arrest. (3) The coexistence of disease, injury, or shock. (4) The nature of alcoholic liquor consumed. (5) The amount of alcoholic liquor consumed. (6) The stage of intoxication. (7) The state of the individual in relation to food, muscular fatigue, and mental exhaustion, including want of sleep.

Medical Examination of Cases of Alleged Intoxication.—The following points are worth considering in connection with the usual procedure in the examination of cases of alleged intoxication in this country :—

1. A note should be made of : (a) The time at which the request arrived to attend for the purpose of examination, and the time of arrival at the place of examination ; (b) The times at which the examination begins and is completed ; (c) The time at which, if he does so, the prisoner asks for a second opinion ; (d) The time of arrival of the second doctor, and the time he begins and completes his examination ; (e) All clinical tests applied ; (f) Questions asked and answers given as to illness, liquor consumed, work, fatigue, etc.

2. It is as well not to seek any detailed information regarding the prisoner's arrest until the completion of the examination.

3. The examination should take place under reasonable conditions, particularly in regard to space and light. Gait can only be tested in a largish room ; reading and handwriting tests may be challenged on the ground of poor light ; the latter are of no value if handwriting materials, desk, or light, are open to criticism. (d) The examinee will already have been given the opportunity to summon a second doctor on his own behalf ; the first doctor—that is, the doctor acting on behalf of the police—should give the prisoner, if necessary, a further opportunity, before he commences his examination, of obtaining a second opinion ; so that, if this is desired, no further time need be lost in summoning the second doctor. (e) All tests applied should be simple and easy of comprehension by a layman. (f) The examinee should not be asked to submit to any test, the execution of which is not easily within the competence of the average sober individual. (g) It is optional whether the first doctor offers his clinical notes on the case to the second doctor ; it is optional for the second doctor to see them, if invited to do so, before or after his own examination, or not at all, as he pleases. The first doctor should not, as it may be his practice to do in private consultation, invite his colleague to read them ; his attitude should be : “ I have made a few notes of my findings ; they are here, if you wish to read them ; but perhaps you would prefer not to see them ? ” (h) At the end of each examination the doctor concerned usually informs the examinee of his opinion. In the case of the doctor acting for the police this is obligatory, and the information should be accompanied normally by a reminder of the right, already intimated, to a second opinion. In the case of the second doctor, called by the examinee, it is within that doctor's discretion whether he informs his patient of his opinion or not.

TESTS INVARIABLY APPLICABLE AS DETERMINING : (1) **QUESTIONS OF DIFFERENTIAL DIAGNOSIS ;** (2) **WHETHER IN FACT THE EXAMINEE IS UNDER THE INFLUENCE OF ALCOHOL :—**(a) Temperature ; (b) The rate, rhythm, and character of the pulse ; (c) State and reaction of the pupils ; (d) The condition of the tongue and mouth ; (e) Ordinary speech and ordinary walking gait ; (f) The character and odour of any vomited material ; (g) The smell of the breath.

The *pulse* of a person in normal health who has recently consumed a moderate amount of alcohol is rapid, full, and bounding. The Committee appointed by the British Medical Association to report on “ Tests for Drunkenness ” considered that a rapid pulse is one of the signs upon which little stress can be laid in deciding that a person is under the influence of alcohol. Nevertheless, the bounding character of the pulse is a feature which is so common in persons under the influence of moderate amounts that it may, in conjunction with other signs, be of great help. Allowance will, of course, be made for nervous and other factors in assessing its importance.

The *pupils* in a person who has consumed alcohol are dilated and are very

sluggish in ordinary light; they contract variably in bright light, returning slowly to dilatation on withdrawal of light. In the undisturbed alcoholic sleep they are typically contracted, easily dilating in response to any external stimulus (such as a pinch on the back of the neck); if the person be then left unmolested for half an hour they return to a state of contraction. This, as a differential test, has been found by Glaister to be reliable throughout eighteen years practice.

The *tongue* is dry and white with red edges. The throat is parched; the individual may complain of thirst. Some excessive indulgence is probably unconsciously provoked by the thirst which one or two drinks may produce, such thirst being aggravated by more alcohol. The lips are also dry, and may be caked around the edges, with the residue of beer or stout.

The *gait* and *speech* of a person who has consumed alcohol but whose faculties are not notably impaired, are of some interest. Ordinary gait and speech appear normal, but in prolonged conversation occasional lapses can be observed in the speech, especially if he be a quick speaker, or the conversation demands much thought. If he runs he is liable to slip; if he has to pick his way, as in crossing a stream, or walking in the dark, he may stumble.

Many mistakes of diagnosis have been due to the misleading evidence provided by the *smell* of the breath. This, and the smell of alcohol in the vomit, indicates only that a patient has taken or been given alcohol; great caution, therefore, is necessary, in examining any one whose breath so smells. It is not a legal offence to consume alcohol; the patient may have taken or been given a drink because he was ill. In the absence of illness, however, the smell of the breath may give some indication of the kind and strength of liquor, and the time at which consumed.

Knee-jerks.—Dodge and Benedict found that 30 to 40 c.c. of alcohol increased the latent period of this reflex by about 9 per cent. A similar slowing has been found by other observers. Experience suggests that in the earlier stages both superficial and deep reflexes may be exaggerated.

In considering the value of physical signs the view is inevitable that certain signs, namely, the state of the tongue, the rate and character of the pulse, the state and reactions of the pupils, and the smell of the breath are of small assistance in determining any impairment of faculties, but that, conjunctively, they indicate that alcohol has been consumed.

It is necessary to remember that such conditions as carbon monoxide poisoning and shock may simulate alcoholic intoxication. There is, indeed, no single symptom due to the consumption of alcohol which may not also be a sign of some other pathological condition.

APPLICATION AND INTERPRETATION OF TESTS FOR THE PRESENCE OF AND INTOXICATION BY ALCOHOL.—The following tests are, conjunctively and variably, applicable for the purpose of determining the kind and degree of intoxication present and the degree of impairment of faculties due thereto:—

a. Observational.—(i) Condition of face and lips, and appearance of conjunctivæ; (ii) Hiccup; (iii) Untidiness or disarrangement of hair and clothes, dribbles of saliva, vomit, or liquor on face or waistcoat; (iv) Tremors or jerky movements; (v) Demeanour and behaviour; (vi) Wakefulness or drowsiness; (vii) Ordinary speech; (viii) Ordinary gait; (ix) Interpretation of phenomena.

b. Specific Tests.—In respect of faculties dependent on intellectual and executive efficiency; or on a combination of these:—

i. Intellectual tests: Memory of recent events; orientation for time and space; judgement—all assessable by suitable questions. Tests for emotional reactions, e.g., is the examinee irritable, boisterous, or quarrelsome, etc., indicating irresponsibility or unreliability in behaviour.

ii. *Executive tests* : (Dependent on motor co-ordination, plus, in varying degree, intellectual control and direction.) Habitual purposive acts ; directional gait, following a leader, or crooked chalk-line ; dressing and undressing movements ; picking up a coin ; lighting or putting out a cigarette. Original purposive acts, requiring in varying degree, in addition to habitual executive faculties, visual and aural co-ordination, intellectual discrimination, and initiative. Reading test ; handwriting tests (copying and to dictation) ; calculations (money, figures) ; sorting figures ; turning up an index reference ; picking up a piece of elastoplast stuck to the floor ; drawing a diagram from copy ; maze test.

CONCLUSIONS.—

1. Differential diagnosis between disease or injury and the effects of alcohol must inevitably remain the first and perhaps the most onerous part of the duty of a doctor concerned with any case in which a question of the effects of alcohol arises.

2. The modern tendency of public opinion, of law, and of medicine, is to agree that the measure of intoxication which shall constitute an offence shall be the impairment of faculties necessary for a specific function rather than general alterations in the personality as a whole.

3. The term intoxication may be suitably employed to describe specific incapacity due to the consumption of alcohol.

4. The fact of consumption of alcohol having been established, the nature and extent of any impairment of faculties is, in the present state of medical knowledge, best measured by observational tests of mentality and behaviour, and by specific tests based on the performance of habitual purposive acts and functions such as ordinary walking, ordinary speech, dressing and undressing, etc., and on purposive acts requiring a greater degree of intellectual direction and control, such as reading, handwriting, directional gait.

5. Impairment of faculties as a result of alcoholic or drug intoxication is variable, and the personal equation is a vital factor governing both the kind and degree of impairment which is found.

Estimation of Blood Alcohol in Drunkenness.—

In the MEDICAL ANNUAL (1933, p. 21) it was shown that "as a means of diagnosis of drunkenness urine analysis is valueless, though as a means of determining the minimum amount of alcohol consumed, it may on occasion prove useful" (S. Smith and C. P. Stewart). An abstract of recent work is given below which suggests that the estimation of blood-alcohol may be of value in the diagnosis of drunkenness.

P. H. Andresen² discusses the merits of the various tests for alcohol in the blood of persons suspected of being drunk in a legal sense, and comes to the following conclusions. Knowledge as to the significance of the alcohol concentration in the blood is still imperfect, and it is not justifiable to draw far-reaching conclusions as to any given person's condition merely from the degree of concentration of alcohol. The quantitative examination of the blood for alcohol can, however, even at the present stage, yield important information of a medico-legal character. The following four conclusions may be drawn : (1) A definite opinion can be formed as to the truth or the reverse of a person's statement that he has taken no alcohol whatever, or that he has recently taken large quantities of it. In many cases it may be shown that the statement as to the amount of alcohol taken is not truthful. (2) When an examination, undertaken more than two hours after the last dose of alcohol was consumed, shows an alcohol concentration in the blood above 2.4 per thousand, it can with much certainty be assumed that the person concerned had been under the influence of alcohol in a legal sense at the time the clinical examination was made. (3) When the alcohol concentration of the blood is between 1.5 and 2.4

per thousand, this finding will be confirmatory of the clinical examination if its findings are indicative of some degree of drunkenness. (4) If the alcohol concentration of the blood is below 0.8 per thousand, this finding will be confirmatory of the diagnosis 'not drunk at the time of examination'.

R. Goldhahn³ states that the determination of alcohol in the blood can be carried out on a single drop of blood, but requires the assistance of a trained chemist. As a result of such analyses in a large series of cases Widmark has constructed a curve correlating the incidence of symptomatic drunkenness with the percentage of alcohol in the blood. From this curve it appears that alcohol may be present in the blood up to a concentration of 80 mgrm. per 100 c.c. without the subjects showing any manifestation of being under the influence of drink; at a concentration of about 150 mgrm. per c.c., 50 per cent of cases are demonstrably or visibly drunk, whilst at about 200 mgrm. per 100 c.c. all are drunk. In the police protocols of Germany, if a case is reported as not drunk by the medical attendant, but on analysis of the blood 200 mgrm. per 100 c.c. are found, then the diagnosis of the doctor is negated. According to Widmark 160 mgrm. per 100 c.c. is the upper limit at which it may be considered that a driver may control a vehicle. Goldhahn amplifies this by pointing out that motor cyclists and bicyclists show insufficient control at far lower levels of blood alcohol than 160. Attention is drawn to a formula elaborated by Widmark, by means of which it is possible to calculate the intake of alcohol from the blood alcohol, the body weight, and the time between the ingestion of the fluid and that taken of the blood. The author has found that this estimate gives values within 5 per cent of a known amount of alcohol taken.

REFERENCES.—¹*Jour. Royal Navy Med. Service*, 1933, Jan., 49; ²*Ugesk. f. Læger*, 1932, May 5, 459 (abstract, *Brit. Med. Jour.* 1932, ii, 5); ³*Med. Welt*, 1933, Mar. ii, 336 (abstract, *Brit. Med. Jour.* 1933, i, 102).

DUODENAL ILEUS.

A. Rendle Short, M.D., F.R.C.S.

This condition was apparently first described by Petit in 1900. It is the subject of an article by the late R. P. Rowlands.¹ He related a case in which gastrojejunostomy had been done and undone again without benefit to the patient, diagnosed at last as duodenal ileus, and cured by duodenojejunostomy. It is a common disease. The symptoms are acute, subacute, or chronic attacks of painful distension of the epigastrium soon after meals, with flatulence, nausea, anorexia, and sometimes vomiting, which gives relief. During an attack the dilated duodenum is well shown by barium skiagraphy. Cases can often be relieved by recumbency with elevation of the pelvis; gastric or duodenal lavage may help. Postural treatment, abdominal exercises, and a supporting belt may cure. When the diagnosis is certain and medical treatment fails, the best treatment is **Duodenojejunostomy**.

REFERENCE.—¹*Lancet*, 1933, i, 1107.

DUODENAL ULCER. (See GASTRIC AND DUODENAL ULCER.)

DUODENUM, CONGENITAL STENOSIS OF. (See PYLORUS AND DUODENUM, CONGENITAL STENOSIS OF.)

DYSENTERY, AMŒBIC. (See AMŒBIASIS.)

DYSENTERY, BACILLARY. Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY.—In military stations in Burma R. C. Wats and M. Jafar¹ report finding dysentery bacilli in 126 out of 269 dysenteric stools examined, of which 102 were *B. flexneri*, 11 *B. shiga*, and 8 *B. schmitzi*. Of the total cases 63.9 per cent were classed as bacillary, 12.6 per cent as amœbic, and 23.5 per cent as

indefinite. The so-called metadysentery bacilli have been further investigated, and A. Castellani² records a case of cystitis which he attributes to them, and in a further paper³ he describes a chronic form of the disease with a table of numerous further strains he differentiates by sugar tests. W. L. Forsyth⁴ deals with the association of *B. dispar* with dysentery in Egypt, and he classifies the organism in the large group of *B. coli anaerogenes*, but he regards it as probably a commensal and does not accept it as a cause of dysentery. A. Marino⁵ writes on metadysentery in Erithea and reproduces once more Castellani's table of elaborate sugar reactions from the paper of the latter above referred to.

TREATMENT.—The **Bacteriophage Treatment** of bacillary dysentery in Calcutta is reported on by T. H. McCay⁶ on the basis of an analysis of four years' cases in the European hospital. In only 42 per cent of the cases were the Shiga or Flexner bacilli found, and in 70 per cent the bacteriophage "appeared to have very little effect clinically", but in the remaining 30 per cent it is claimed that "bacteriophage was successful in effecting a speedy cure", the ordinary methods of treatment also employed not apparently being given any credit. P. Seguin, of Paris, reports⁷ on the antigenic power of anti-dysenteric **Bilivaccine** as shown by a serological method, and he disputes the conclusion of Wats and White in 1931 that repeated injections of strong emulsions of antidysenteric bilivaccine fail to produce antibodies in rabbits, maintaining that they are produced with some difficulty if sufficiently strong and frequent doses are used.

REFERENCES.—¹*Ind. Med. Gaz.* 1932, Aug., 446; ²*Jour. Trop. Med. and Hyg.* 1932, Nov. 15, 337; ³*Ibid.* 1933, April 15, 109; ⁴*Ibid.* March 11, 65; ⁵*Ibid.* 69; ⁶*Ind. Med. Gaz.* 1932, Dec., 666; ⁷*Ibid.* 1933, Feb., 83.

DYSENTERY IN CHILDREN.

Reginald Miller, M.D., F.R.C.P.

D. Nabarro and A. G. Singy¹ are of opinion that dysenteric infections are more frequent in this country than is generally recognized, and that many instances of this type of intestinal infection go undiagnosed under such labels as 'gastro-enteritis' or 'ileo-colitis'. Such mistakes may be dangerous, as dysentery easily spreads from one child to another in a children's ward. For rapid bacteriological diagnosis the micro-organism is grown, preferably from the mucus of the faeces, on McConkey plates, and, without waiting for fermentation sugar reactions, is typed by agglutination reactions with specific sera for Flexner V, W, X, Y, Z and Sonne bacillus, which are the commonest strains. By such means a diagnosis may be reached in eighteen hours.

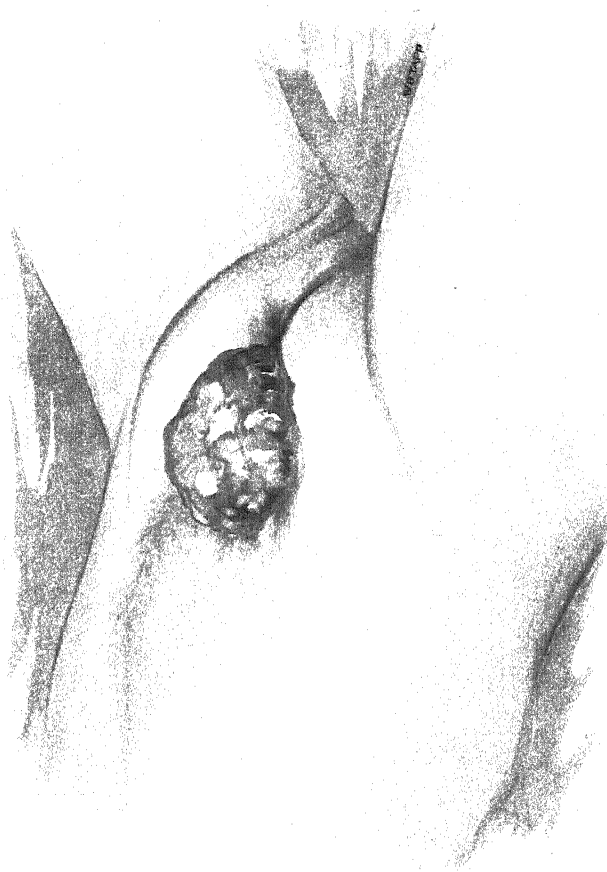
SYMPTOMS.—In most cases there is abdominal pain, rapidly followed by diarrhoea with blood and mucus in the stools. At first there may be but very little faecal material with the evacuation of the blood and mucus. The temperature runs up to 100° to 103°. Older children are rarely severely ill, but in very young ones the dehydration and toxæmia may lead to serious, even fatal, results. In many instances the attack is over in two or three days. The outlook depends not only on the age of the child but on the type of micro-organism, infections by the Sonne bacillus being less serious than those by the Flexner type.

TREATMENT.—Two methods of medicinal treatment are commonly adopted: by means of **Saline Aperients** and by means of intestinal sedatives such as **Bismuth**. The authors express no particular preference for either line of treatment, both giving equally good results.

Ward Outbreaks of Dysentery.—Dysentery spreads rapidly among children living together, and more particularly amongst sick children. The initial infection may come either from an undiagnosed case of diarrhoea or from

PLATE XIX

ECTOPIA VESICÆ



a symptomless dysentery carrier, and perhaps the first information of its presence in a ward will be a crop of half a dozen cases amongst the children and one or more amongst the nursing staff. When it is remembered that the infection is from faeces through fingers or food, it is disturbing to find with what ease and rapidity it spreads. All patients must therefore be treated as highly infectious, and no nurse that is detailed to attend to the stools of a dysentery patient should be allowed to touch the food of any other patient.

REFERENCE.—*Arch. of Dis. Childh.* 1932, vii, 327.

EALES' DISEASE. (See VITREOUS HÆMORRHAGES, RECURRENT.)

ECTOPIA VESICÆ.

A. Rendle Short, M.D., F.R.C.S.

The little girl suffering from ectopia vesicæ, illustrated in *Plate XIX*, was operated on by the Coffey technique, and first one ureter, then a few months later the other, put into the sigmoid colon. At a third operation the bladder was excised. She can now hold the water in the rectum for four to six hours by day and goes ten hours or longer at night.

ELECTROCARDIOGRAPHY. (See also ARRHYTHMIAS; CORONARY ARTERY DISEASE.)

A. G. Gibson, M.D., F.R.C.P.

J. Jensen, M. Smith, and E. D. Cartwright¹ have noted the effects of age in the electrocardiogram as shown in fifty persons between the ages of 50 and 65 who had *no symptoms of cardiovascular disease*. They point to Fahr's estimate that 23 per cent of deaths after the age of 50 are due to heart disease. In their series few of these hidden cardiac lesions could be demonstrated. The following electrocardiographic signs, hitherto considered pathological, appear to be of no significance: diphasic P waves in Lead I or inverted P waves in Lead III which became upright on deep inspiration; slurring of the QRS complex whose interval was less than 0.1 sec.; moderate inversion of T in Lead III. Other recognized changes in the electrocardiogram, such as inversion of the P wave in Leads I and II, or in Lead III if the inversion persists during inspiration, were not found and are therefore suspicious. Inversion of the T waves in Leads I and II, again, if they do not become upright with deep inspiration, a PR interval of more than 0.2 sec., and QRS intervals exceeding 0.1 sec. are also abnormal. Their conclusion is that there are no characteristic signs of commencing old age in the electrocardiogram.

In last year's MEDICAL ANNUAL (p. 55) the work of Speckman and Rich was reported as indicating that an *electrocardiogram at low voltage* was of very serious importance. M. A. Cassidy and H. B. Russell² modify and enlarge this conception. In the cardiographic department of St. Thomas's Hospital they have examined a series of 720 cases, in all of which the clinical history was unknown or excluded in the deductions made from the electrocardiogram: 20 showed low voltage curves in all three leads. The remaining 700 tracings were divided into three groups: (1) Those in which the cardiovascular system after a full examination was normal; (2) Those in which the electrocardiogram was normal in all other respects although the heart was affected; and (3) Those in which the heart was affected and the electrocardiogram was abnormal. They conclude that low voltage curves in Lead I are found in patients with normal as well as abnormal hearts and no special significance can be attached to it alone, but when the electrocardiogram is abnormal in other respects it has some significance, as a large percentage of these cases have gross muscle damage. When low voltage occurs in Lead II and the electrocardiogram is otherwise normal, it is suggestive of muscle damage. It occurs with relative

frequency in tracings with a left axis deviation. Low voltage curves in Lead III were common and have no special significance. Low voltage in all three leads occurred in 1.75 per cent of the electrocardiograms examined. When there is cardiovascular degeneration it justifies a bad prognosis. Again, when low voltage curves occur in Lead II or in all three leads their presence indicates a bad prognosis and suggests cardiovascular degeneration. No low voltage curve, however, is of great importance unless considered in conjunction with the other facts of the patient's case.

K. B. Turner³ agrees as to the seriousness of low voltage curves. A series of 164 cases, all of which had low voltage curves in all three leads, showed that 113 (68 per cent) had serious heart disease. In those patients without heart disease there was a serious condition in some other system, such as the accumulation of fluid in one of the body cavities.

In regard to the *significance of a large Q wave in Lead III*, the papers by S. Strauss and L. Feldman⁴ and T. Ziskin⁵ are worthy of note. In the first paper, of 2000 electrocardiograms studied, this abnormality was found in 75 cases. The Q wave was taken to be large when it fulfilled the definitions of Pardee—namely: (1) In Lead III the downward initial deflection Q with an upward R wave and no S wave: (2) This Q deflection in Lead III must be more than 25 per cent of the greatest excursion of the QRS complex in any lead. Right axis deviation must be eliminated, as a downward Q in Lead III is a normal finding in such records. Of 75 cases, 72 per cent were associated with diseases largely affecting the left ventricle; hypertensive heart disease accounted for 33 per cent, an anginal syndrome was present in 16 per cent, syphilitic aortitis in 12 per cent, and arteriosclerosis in 10 per cent. Rheumatic heart disease constituted 16 per cent. Their conclusion is that this large Q wave is a valuable diagnostic sign, rarely found in normal hearts, and associated with diseases affecting the left ventricle. In Ziskin's series 61 per cent were found in patients with hypertension, coronary disease, or myocardial affection.

C. Eggleston and S. Weiss⁶ refer to the *inversion of the T wave* which is attributed to the action of digitalis in certain cases. In their series in only 18 per cent of cases could an inversion of the T wave be attributed to this cause. They found that inversion bore no necessary relation to the total dose of digitalis, because it occurred with moderate as well as large doses. They suggest that it cannot be regarded as a characteristic manifestation of digitalis and that it is not a safe guide for the control of the action of the drug. It is more likely, they suggest, that digitalis unmasks in these cases a myocardial degeneration than that it is primarily due to the drug.

I. G. W. Hill⁷ has made an electrocardiographic study of the human heart in *anæsthesia*. In 8 out of the 16 cases in which chloroform was used gross disturbances were produced, multiple ventricular extrasystoles, supraventricular tachycardia, and in one case a vagal arrhythmia. These disturbances were a feature of the period of induction and disappeared with the deepening of the anæsthesia. They are thought to indicate a phase in light chloroform anæsthesia which may develop into fibrillation, and they obviously have some relation to chloroform syncope, which the author suggests is due to ventricular fibrillation. The effects of other anæsthetics were to produce minor abnormalities. Under gas and oxygen a marked slowing during induction was seen. Avertin and gas and oxygen tend to show more disturbance than gas and oxygen alone. Slowing of the heart followed traction on the carotid vessels or interference with the recurrent laryngeal nerves, but operative manipulations on the abdominal organs were mostly without influence on the heart.

E. Noble Chamberlain and J. H. Follows⁸ give an account of the electrocardiogram in 232 cases of *syphilis* with 156 controls. They found no clinical

or electrocardiographic evidence in congenital syphilis or in the primary or secondary stages of the acquired disease. Gross electrocardiographic changes were found in six cases. The interval from the primary infection was from three to thirty years. Minor alterations in the electrocardiogram were present in a further 8 cases, in one within a year from the primary infection. In three patients with aortic regurgitation the electrocardiogram was normal, 11 cases showed slight cardiac hypertrophy with no other abnormal signs. Favourable modifications of the electrocardiogram were seen in several patients during antisyphilitic treatment.

A. Battro⁹ points out that in *mitral stenosis* the alterations of the P wave are of importance in diagnosis and prognosis. In hyperactivity of the auricle the P wave is higher than normal and its base above the normal of 0.1 sec. The wave may have notches or be reduplicated. A diminution of this wave under 1 mm. is an indication of lessened contractile energy of the auricular myocardium, and a wave of this type frequently preceded the appearance of cardiac insufficiency or auricular fibrillation. With good compensation the T wave also is large, often from 5 to 6 mm. in height. An inverted T wave for Leads II and III was observed in two-thirds of the cases, and in one case of mitral stenosis with hypertension there were inverted T waves in Leads I and II. Further changes in the electrocardiogram are interpreted by the author as being produced by strain of the muscle of the right ventricle.

S. B. Boyd Campbell and R. S. Allison¹⁰ report electrocardiographic changes in 3 out of 8 cases that were examined of *toxic polyneuritis*, in which cardiac symptoms and a tendency to oedema were marked. The change produced was an inverted T wave which returned to normal after the patients had recovered. The cases resembled each other in their insidious mode of onset and their chief clinical features—pains in the limbs, palpitation, persistent vomiting, shortness of breath on exertion, and swelling of the feet and legs. No etiological factor could be discovered in any of the cases.

REFERENCES.—¹*Amer. Heart. Jour.* 1932, Aug., 718 (abstr. *Brit. Med. Jour.* 1933, Jan. 21); ²*Brit. Med. Jour.* 1932, Dec. 31, 1177; ³*Arch. of Internal Med.* 1932, Sept., 380; ⁴*Amer. Jour. Med. Sci.* 1933, Jan., 87; ⁵*Arch. of Internal Med.* 1932, Sept., 435; ⁶*Amer. Jour. Med. Sci.* 1932, Oct., 582; ⁷*Edin. Med. Jour.* 1932, xxxix, 533; *Lancet*, 1932, i, 1139; ⁸*Quart. Jour. Med.* 1933, April, 221; ⁹*Jour. Amer. Med. Assoc.* 1932, July 30, 429; ¹⁰*Lancet*, 1933, ii, 410.

ELEPHANTIASIS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

This condition may occur in patients suffering from chronic rheumatoid arthritis. It is not by any means confined to patients who have lived abroad and who develop true filarial disease. Elephantiasis is a chronic inflammatory process of the dermal and hypodermal tissues, either preceded by or accompanied by venous and lymphatic stasis. Stasis alone will not produce the condition without infection. Matas and others maintained that repeated bacterial invasion, usually by the streptococcus, is essential in the production of elephantiasis. Such a case was referred to by the reviewer in the MEDICAL ANNUAL for 1931 (p. 168). The patient had repeated waves of bacterial infection. Both limbs required amputation. Such cases have a prolonged history often extending over twenty years. In true filarial elephantiasis the lymph channels are obstructed by the parasites, thus producing fertile soil for the invasion of the streptococcus.

G. P. Muller and C. G. Jordan¹ draw attention to these points. They state that the treatment of this disease should be both medical and surgical. The medical treatment consists of: (1) Baking and massage (usually pre- and post-operatively); (2) Elevation of limb (usually pre- and post-operatively); (3) Compression of limb by elastic bandages; (4) Injection of streptococcus

polyvalent serum; (5) Vaccine therapy; (6) Fibrolysin; (7) Foreign-protein therapy (typhoid, aolan, and whole blood).

There are several cases reported in the literature, especially in more recent times, which have been treated very successfully with **Vaccine and Anti-streptococcus Serum** alone, and it is worth while to employ this treatment in every case possible. A recent case in Muller and Jordan's series has shown this. This medical treatment, if it can stop the acute attacks, might be sufficient. In more advanced cases, however, if once the elephantiasis proper has developed, medical treatment is of importance only so far as it helps to prepare the patient for operation, and, again, post-operatively helps to prevent very disastrous erysipeloid attacks.

The surgical treatment resolves itself into the **Kondoléon Operation** or one of its modifications, or amputation. Good immediate results follow operation of the Kondoléon type, but the permanent results are not so encouraging. The actual technique of the operation consists of an elliptical excision of the skin, reflection of the skin flap at least 6 cm. laterally, and then removing a large section of subcutaneous tissue and deep fascia. The muscle is exposed and brought into direct contact with the skin. The rationale is fully described in the literature.

REFERENCE.—¹*Ann. of Surg.* 1933, Feb., 226.

EMBOLISM. (*See BLOOD-VESSELS, SURGERY OF.*)

EMPHYEMA IN CHILDREN.

John Fraser, Ch.M., F.R.C.S.Ed.

It is generally recognized that the mortality attending empyema in children in the first two years of life is forbidding. In a series of cases collected from five of the largest American hospitals for children it averaged 35·8 per cent, and the figure is very similar to that reported from Continental clinics.

J. D. McEachern¹ reports results which are better than any previously recorded; in a total of 75 cases the mortality figure was 2·66 per cent, the ages ranging from 4 months to 11 years. In a selected group of children under 2 years of age the figure was 9·32 per cent.

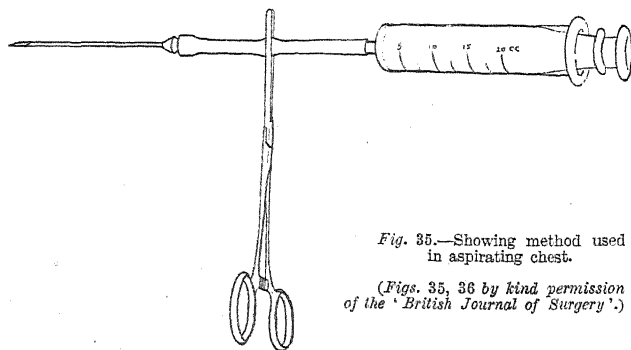


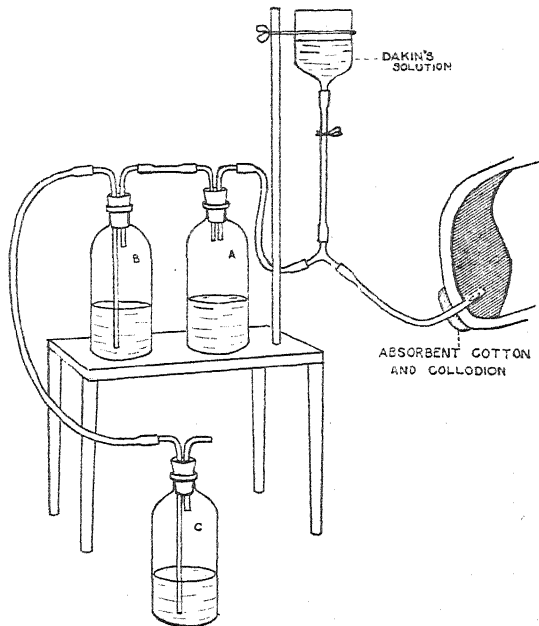
Fig. 35.—Showing method used in aspirating chest.

(Figs. 35, 36 by kind permission of the 'British Journal of Surgery'.)

It is evident that a method associated with such remarkable results is worthy of careful consideration. The procedure followed by the author is that of **Closed Drainage**, and in summary it is as follows. The preliminary aspiration of the chest is so arranged that no air is permitted to enter the pleural cavity, a wide-bore hollow needle attached to a piece of rubber tubing 5 cm. long being used, an artery forceps clamped on the tubing preventing

the entrance of air when the needle is being introduced into the chest and when the syringe is detached for emptying (*Fig. 35*). The existence of pus having been confirmed, the further stage is completed under local anaesthesia. A trocar and cannula are introduced between the ribs at a suitable point; the trocar is then withdrawn, and immediately the index finger is placed on the end of the cannula to exclude air. The operator now takes the catheter in his right hand, removes his finger from the end of the cannula, and inserts the catheter into the pleural space. It is recommended that it should project into the cavity for a distance of $1\frac{1}{4}$ in., and the exact depth is ascertained by the use of a marked catheter. The instrument is temporarily closed while the cannula is withdrawn, and the point at which the catheter enters the chest wall is sealed with successive layers of wool soaked in collodion. When the sealing dressing is dry, the catheter is connected up with a special drainage

Fig. 36.—Closed drainage in empyema. To irrigate the cavity the rubber tube connecting the Y glass connection with bottle A is clamped, after which the clamp is removed from the tube connecting the Y with the container for Dakin's solution; when the abscess cavity is filled the solution is clamped off and the clamp between the Y connection and bottle A removed, allowing the solution to drain off by suction into bottle A. To remove the solution accumulated in bottle A, clamp both rubber tubes leading from the glass connections in the cork; the cork may then be withdrawn and the bottle emptied without disturbing the siphon. Bottles B and C are interchangeable. When bottle B is nearly empty place a clamp on the rubber tubing between bottles B and C; the bottles are then changed, placing the empty one on the floor and the full one on the table.



and irrigation appliance (*Fig. 36*). Irrigation of the cavity is begun twenty-four hours after the instrument has been inserted, and it is repeated two-hourly during the day, and three times at night, Dakin's solution being the medium employed.

R. Brann² reports experiences with 125 cases of pleural empyema in children. While small empyemas, such as the interlobar types, received the customary conservative treatment, extensive empyemas in nurslings were treated by repeated aspirations. In children of more than one year of age aspirations were repeated at intervals until the thickening of the secretion or the formation of fibrin clots made them useless, or until it was seen that the treatment was insufficient. During this period of not less than one week and not more than two the acute manifestations recede, the bacteria lose their virulence, and fibrinous infiltrations and adhesions fix the position of the organs, so that

when the pleural cavity is opened mediastinal fluttering and circulatory disturbances can scarcely occur. Following this preparatory treatment resection of the ribs was performed under local anaesthesia with closed drainage. Respiration exercises against resistance were started soon after the intervention, and were continued after treatment of the wound was concluded. The average duration of treatment was six and a half weeks. Of 64 children operated on according to this method, including 3 nurslings, 89.1 per cent were cured and 10.9 per cent died. Significant deformities of the thorax and spinal column were not observed in the children in whom late examinations were made. These results encourage the indication for rib resection after preparatory aspirations, even in nurslings.

REFERENCES.—¹*Brit. Jour. Surg.* 1933, April, 653; ²*Monats. f. Kinderheilk.* 1933, April 1, 326.

ENCEPHALITIS, EPIDEMIC.

J. D. Rolleston, M.D., F.R.C.P.

ETIOLOGY.—A. M. Rabin¹ reports eight cases in men, aged from 19 to 39, presenting the clinical picture of epidemic encephalitis, in whom the chief interest was a history of trauma. His conclusions are as follows: (1) After an injury to the head in which there is evidence of intracranial involvement the subsequent development of the syndrome of epidemic encephalitis must be regarded as having been caused by the trauma. (2) A patient who has had an attack of acute epidemic encephalitis may have the chronic manifestations such as Parkinsonism initiated or produced by injury to the head, provided it is severe enough to cause cerebral concussion. (3) If an individual with partial clinical evidence of encephalitis, such as tremor, or loss of associated movements, has an injury, the progress in the symptoms is not attributable to the trauma. (4) An injury to any part of the body except the skull, particularly when not associated with signs of cerebral concussion, has no effect on the clinical course of epidemic encephalitis.

SYMPTOMS AND COMPLICATIONS.—P. Frazer and A. S. Barnes² record three more or less *fulminating cases* with their autopsy findings in patients aged 57, 52, and 39 respectively. In all these was a prodromal period of one to two weeks, consisting of malaise, headache, lethargy, and constipation. The first case had a subacute course of about six weeks. The autopsy showed the maximum incidence on the mid-brain, the lesions spreading thence upwards to the hypothalamic region and basal ganglia and downwards to the pons and medulla oblongata. The other two cases were remarkable for the fulminating character of the disease after the prodromal period was passed, the acute stage lasting only four days. Both patients showed complete mental obliteration and both cases terminated similarly with hyperpyrexia. The macroscopic and microscopic appearances of the brain were typical in all three cases.

S. P. Goodhart and N. Savitsky³ report a case of *self-mutilation* in chronic encephalitis in a girl, aged 16, of Russian Jewish parentage, consisting in avulsion of both eyeballs and extraction of teeth, all but seven of which she pulled out in the course of two years. This is the only example in literature of self-blinding in chronic encephalitis.

TREATMENT.—J. B. Neal and I. A. Bentley⁴ classify the methods of treatment of epidemic encephalitis as follows:—

1. Methods for the destruction of the infective agent—namely: (a) Chemical, such as acriflavine and other dyes, salicylates, iodine preparations, colloidal metals, arsenicals, and mercury derivatives; (b) Methods for production of febrile reactions, such as non-specific proteins, fixation abscess, inoculation of malaria or African recurrent fever; (c) Serums, including convalescent serum,

Rosenow's antistreptococcic serum, Gay's hyperimmune rabbit serum; (d) Vaccines, such as Levaditi's or Gay's herpes rabbit brain serum, and Rosenow's and Stewart's vaccines.

2. Methods for modifying the course of the disease by reducing intracranial pressure, such as intravenous injection of hypertonic dextrose or iodine solution, and lumbar puncture.

3. Symptomatic treatment: (a) By drugs, such as duboisine, scopolamine, stramonium, atropine, bulbocapnine, and ephedrine sulphate; sedatives, such as phenobarbital, bromides, or chloral hydrate; and (b) Endocrine therapy.

4. Methods for building up general resistance, namely: (a) General hygienic measures, such as rest, diet, and proper elimination; (b) Removal of foci of infection; (c) Tonics, such as sodium cacodylate, iron preparations, and strychnine; (d) Physical therapy, including hydrotherapy, electrotherapy, X-ray treatment, massage, and graduated exercise; (e) Occupational therapy; (f) Psychotherapy.

The results, however, of any form of treatment for the disease are inconclusive, as improvement may occur with or without treatment.

B. I. Glowinski⁵ reports seven cases of Parkinsonism in patients aged from 20 to 74, in which considerable improvement had been derived from subcutaneous injections of **Datura Stramonium**, as shown by diminution of rigidity, pain, muscular hypertonus, affection of speech, salivation, sweating, and in a less marked degree of the tremor. The injections should not as a rule be continued for more than twenty days owing to their giving rise to somnolence and disturbance of accommodation. The dose should range from 1 to 2 cgrm. a day according to the susceptibility of the patient and the effect produced.

(See also CENTRAL NERVOUS SYSTEM, TREATMENT OF INFECTIONS OF.)

REFERENCES.—¹N. Y. *State Jour. of Med.* 1933, xxxiii, 796; ²*Brit. Med. Jour.* 1933, i, 90; ³*Amer. Jour. Med. Sci.* 1933, clxxv, 674; ⁴*Arch. Neurol. and Psychiat.* 1932, xxviii, 897; ⁵*Thèse de Paris*, 1933, No. 52.

ENTERIC FEVER. (See PARATYPHOID FEVERS; TYPHOID FEVER.)

ENURESIS. (See BLADDER, SURGERY OF.)

EPIDIDYIMIS, SURGERY OF. (See TESTIS, ETC., SURGERY OF.)

EPILEPSY.

Macdonald Critchley, M.D., F.R.C.P.

The Aura in Epilepsy.—W. G. Lennox and S. Cobb¹ have studied a series of 1359 cases of epilepsy with regard to the nature of the auræ. In 56·2 per cent of their cases an aura was present. This closely tallies with the findings of Sir Wm. Gowers, who, in a series of 2013 patients, found an aura in 57 per cent. According to the figures of Lennox and Cobb, an aura is slightly more common in female epileptics. When cases of organic (or symptomatic) epilepsy were separated from the group of idiopathic cases, it was found that the percentage with auræ was 54·4 in the former and 56 in the latter group. The authors conclude that mental deterioration is associated with a decreased frequency, or at least a decreased recollection, of auræ: here again the American statistics confirm the statement of Gowers', that auræ are more frequent among intelligent patients than those who are mentally deteriorated. Lennox and Cobb give a detailed tabulation of the descriptions of auræ as given by 750 patients, the 'organic' and the 'idiopathic' cases being mentioned separately. Auræ of potential localizing value (disturbances of peripheral sensations, paræsthesiæ, numbness, disorders of taste, vision, hearing, or smell, or abnormal movements) occurred in 70 per cent of the

patients with a history of injury of the brain antedating the seizures, and in 41 per cent of those without such a history.

Subjective states which were either pleasant (one-fifth of the cases) or unpleasant (four-fifths of the cases) were described by 6.7 of the patients; 2.2 per cent described disturbances of consciousness. About one-fifth of the patients had sensations which they were unable to describe adequately. The head was the portion of the body to which the aura was most often referred; the aura in fully half of the patients concerned the mental state, the general feeling of mood, or the head. The largest group of auras which related to the trunk was referred to the digestive tract (18.7 per cent).

Cysticercus Epilepsy.—"The importance of cysticercus as a cause of epilepsy is not sufficiently realized either in the service or by practitioners in the tropics. The onset of epileptic seizures in a previously normal adult during or after service (or residence) abroad, should suggest the possibility of this condition." The importance of these sentences—taken from the *Report on the Health of the Army*, 1930—is well illustrated by the interesting work of Col. W. P. MacArthur.² An investigation into the etiology of epilepsy developing in soldiers during or after service in the tropics (particularly India) revealed the importance of infection with the cysticercus or bladder worm stage of *Taenia solium*. Of the batch of 9 epileptics recently studied at Millbank Hospital, cysticerci were recorded in 3; of another batch of 5, 1 gave a positive result. Of the last 22 cases of epilepsy admitted to Millbank, 10 have proved to suffer from cysticercus, while some of the others showed certain suggestive symptoms. The cysticercus stage of *T. solium* normally develops in the pig, and the eating of pork so infected leads to the infestation of the human with the adult tapeworm. Occasionally, however, man serves as the intermediate host through the accidental ingestion of tapeworm eggs. The bladder worms tend particularly to invade the brain, and when large numbers are present, complicated and puzzling neurological manifestations develop. A clinical picture resembling that of disseminated sclerosis, hydrocephalus, or cerebral tumour may show itself. Two interesting cases illustrating syndromes of raised intracranial pressure have recently been reported by S. S. Allen and H. W. Lovell.³

With a less severe invasion of the nervous system, epilepsy may constitute the sole neurological symptom. The fits may be Jacksonian in type, or, on the other hand, typical of grand mal. The clue to the true nature of the complaint is afforded by the presence of small subcutaneous or intramuscular swellings formed by parasitic cysts. These may appear coincidentally with the onset of epilepsy or they may antedate the fits. They may be solitary, but more often they are multiple; the patient may or may not be aware of their existence, and they do not occasion any special discomfort. They vary in size from a small pea to a pigeon's egg. After a period the larva within the cyst dies, and the parasite itself—later the cyst wall—becomes calcified. A characteristic X-ray picture then results, showing in the early stages a tiny elongated shadow, and later a larger and more definite opacity (*Plate XX*). In the majority of MacArthur's cases there was no history of infection with tapeworm, though in the case with a definite history of infestation it was possible to fix the incubation period of epileptiform symptoms as four years. The absence of subcutaneous cysts does not entirely exclude the diagnosis of cysticercosis, as cysts may be within the brain only. In such cases an appropriate complement-fixation test is useful. A negative complement-fixation test does not, however, rule out the diagnosis of cysticercosis. Nothing suggestive was found in an eosinophil count in any of MacArthur's cases.

A. G. Duncan⁴ found suggestive changes in the cerebrospinal fluid in a case

PLATE XX

CYSTICERCUS EPILEPSY

(W. P. MACARTHUR)



A characteristic X-ray picture showing calcified cysts.

*By kind permission of the
Transactions of the Royal Society of Tropical Medicine and Hygiene*

of cerebral cysticercosis, where the eosinophil count in the blood was only 2 per cent. The fluid contained an excess of protein (110 mgrm. per cent); Lange 1 1 2 3 3 4 3 2 2; 35 cells per c.mm., mainly polymorphs, but also including eosinophils.

The pathology of cerebral cysticercosis has been carefully studied by A. Opalski⁵ in a series of 12 personally observed Polish cases. Parasitic cysts were found to lodge in the meninges at the base of the brain; great increase in the connective tissues of the meninges results. This interferes with the free circulation of the cerebrospinal fluid and is the chief cause of the frequent hydrocephalus. The capsules of the cysts show histologically three layers: (1) An inner layer of epithelioid and giant cells; (2) A middle layer of collagen fibres and scattered fibroblasts; and (3) An outer layer of young connective-tissue cells forming a network within which is contained a large variety of cellular elements. The nerve-tissue surrounding the cysts shows degenerative changes and secondary glial proliferation. Vascular lesions and small softening are commonly present. According to the author, the pathological changes result from the following three factors: (1) Pressure exerted by the parasites; (2) Circulatory disturbances secondary to the blood-vessel changes; and (3) Toxic substances formed by the cysts and transported by the cerebrospinal fluid. The author regards the third factor as the most important.

Treatment of Status Epilepticus.—The occurrence of status epilepticus constitutes a medical emergency which fortunately is not a common event in ordinary practice. Those working in colonies and institutions for epileptics are the only ones with wide experience of this complication, and no one can speak on this subject with greater authority than J. Tyler Fox,⁶ the Superintendent of Lingfield Colony. In a recent paper he deals with the difficulties of prognosis and treatment. A dramatic rise in temperature as well as in the pulse- and respiration-rates, accompanied by cyanosis and exhaustion, are the gravest possible omens. The outlook is more hopeful in hemiplegic patients with status epilepticus, so long as the convulsive movements are confined to the paralysed side. With regard to the nursing of patients in status epilepticus, the author advises that the temperature, pulse, and respiration should be recorded hourly. Great care should be taken to maintain an adequate airway; tongue-forceps and a mouth-gag may be required. The pharynx should be frequently swabbed clear of mucus. Cold or tepid sponging is indicated if hyperpyrexia develops. Tyler Fox is disappointed with the effects of hyoscine injections as well as with the rectal administration of paraldehyde, though both these measures are repeatedly advocated. Morphine, according to the author, is a dangerous remedy. Easily first among therapeutic procedures is the mere washing-out of the rectum with a **Soap and Water Enema**. This should be ordered irrespective of the state of the bowels. The mode of action is very obscure and the author wonders whether the mere rapid dilatation of the rectum and colon may not be the essential factor. Next most powerful among the remedies is **Chloral Hydrate**, given in doses of 30 to 40 gr. by mouth. Should it be necessary to administer the drug by the rectum, the same dosage should be employed. The third most efficacious measure—in the author's experience—is the intramuscular injection of **Somnifaine**, in a 2-c.c. dose, which may be repeated if necessary. Hypodermic injection of solutions of **Sodium Luminal** (4 to 6 gr.) are often helpful. Bromides are probably ineffectual except in extremely large doses.

Dehydration Treatment.—In the MEDICAL ANNUAL, 1931 (p. 178), a description was given of some recent views on the Hippocratic conception of epilepsy as the effect of water-logging or hydrosis of the central nervous system, and a

therapeutic régime was outlined which had its rationale in a process of active dehydration. This treatment is effected by means of spinal drainage, combined with rigorous restriction of the intake of fluids. Favourable results in epilepsy have been claimed by Temple Fay, the originator of this therapeutic measure. Since that date, the treatment has been tentatively put into practice at various centres throughout the world. It is interesting at this stage to examine the reports that have issued.

The older treatment by means of a ketogenic diet and the more recent dehydration therapy have in common the effect of reducing somewhat the alkali reserve of the body. The recent work of D. M. Lyon and D. M. Dunlop⁷ is of interest in this connection. In two cases of epilepsy they were able to produce or aggravate the fits by increasing the fluid intake and by checking diuresis with pituitrin. Thus they confirmed the findings of I. McQuarrie and D. B. Peeler⁸ in epileptic children. Lyon and Dunlop were also able to aggravate epilepsy by the administration of sodium bicarbonate—a measure which simultaneously raised the alkali reserve of the blood. The authors therefore attempted a form of treatment which would combine a reduced carbohydrate intake and a certain degree of dehydration. This they essayed by reducing the carbohydrates to 100 to 130 calories daily; reducing fluids to the minimum consistent with comfort; the production of one or two watery stools daily by means of saline purges; stimulation of diuresis by 10 gm. of urea twice daily; and the lowering of the alkali reserve by ammonium chloride, 20 to 40 gr. three times a day. Elimination of water by the skin was encouraged by physical exercise or by hot-air baths. Five patients were treated in this way with full biochemical controls. A sharp fall in weight was the first effect, especially in the early days. There was some reduction of the alkali reserve. The effect on the fits was beneficial in the beginning, the major attacks being more favourably effected than the minor. Improvement was not sustained, however, but tended to wear off after some days, and at times the fits returned in flood towards the end of the observation. [This type of result is a characteristic epileptic response to almost any experimental 'therapeutic' measure.—M.C.] In the authors' hands **Luminal** proved much the most powerful of the therapeutic agents observed, a finding which will accord with the experience of the neurological consensus. Whether the effect of luminal can be enhanced by a mixed ketogenic-dehydration régime is not yet clear, though the results are suggestive in the small number of cases treated by Lyon and Dunlop.

Other recent reports are on the whole unfavourable as to the value of dehydration in the treatment of epilepsy. Thus J. L. Fetterman and H. J. Kumin⁹ conclude that a programme of dehydration has little influence on the course of epilepsy. In their hands the change-over to hydration did not precipitate attacks with any regularity. On the other hand, the results of other changes in treatment, such as withdrawal of phenobarbital (luminal), emphasizes the relatively minor rôle played by fluid-intake. G. Wilson and W. A. Limberger¹⁰ also found that dehydration by itself was not of much value. They found that status epilepticus might develop in patients on extreme degrees of dehydration, and moreover that an increase in the number of fits does not necessarily result from the administration of large amounts of fluid after a period of dehydration.

REFERENCES.—¹*Arch. of Neurol. and Psychiat.* 1933, xxx, 374; ²*Trans. Roy. Soc. Trop. Med. Hyg.* 1933, xxvi, No. 6; ³*Ann. of Surg.* 1933, xevii, 1; ⁴*Med. Press and Circ.* 1933, May 24, 423; ⁵*Bull. Acad. polon. d. Sci. et d. Lett. (Classe de Méd.)*, 1931, Oct., Dec., 276; ⁶*Med. Press and Circ.* 1933, Aug. 2, 115; ⁷*Edin. Med. Jour.* 1933, May, 266; ⁸*Jour. Clin. Investig.* 1931, x, 915; ⁹*Jour. Amer. Med. Assoc.* 1933, April 1, 1005; ¹⁰*Ibid.* July 8, 110.

EPITUBERCULOSIS.*Reginald Miller, M.D., F.R.C.P.*

Several communications on this interesting condition have appeared within the last two years. A quotation from a paper by H. V. Morlock and A. J. Scott Pinchin¹ will serve as an introduction:—

“In 1920–21 Eliasberg and Neuland² described a series of cases of a condition of the lungs occurring in children with a very definite clinical picture, and for this condition they suggested the term epituberculosis. Since then other authors, Goldberg and Gasul,³ Rothman,⁴ Gravinghoff,⁵ Spence,⁶ Gorter and Lynac,⁷ Langer,⁸ and others have described similar cases under the same title.

“The history, symptomatology, radiological appearances, and course of the condition are very characteristic in all the cases described. As a rule the child is young and may be ailing, but is not usually ill. Fever is absent more often than not, or, if present, is slight in degree, and an unproductive cough is usually present. The sputum, if obtainable, or the faeces contain no tubercle bacilli. The Mantoux or Pirquet test is mostly positive and has been so in all our cases.

“There is marked impairment of the percussion note usually over the upper lobe, and in this area there is increased resonance and bronchial breath-sounds. Adventitious sounds are usually absent. Slight retraction of the chest may sometimes be noted, though it is difficult to be sure of this in children. These signs remain for weeks or months without any deterioration of health and then they gradually disappear, this recovery being a constant feature. The radiological picture is as constant and typical as the physical signs. On radiography the area involved shows as a homogeneous shadow which reaches from the hilus to the parietal pleura, the upper border extending to the apex whilst the lower has a clear-cut margin which, in our cases and in the great majority of the skiagrams of cases of the authors mentioned above, would appear to coincide with the interlobar pleura. Further, the clear-cut lower margin of the shadow has usually a slight concavity upwards.”

This condition was first described by Grancher in 1883, and was called by him ‘splenopneumonia’, and regarded as a type of subacute pneumonia; but in 1911 it was definitely associated with tuberculosis of the mediastinal glands by R. Dumas. All are agreed upon the general outline of the type of case: the physical signs, the X-ray picture, the association with intrathoracic tuberculosis, the absence of severe illness, and the ultimate recovery. Its interpretation is a matter of discussion, and the following suggestions have been put forward:—

1. *Collapse*.—Collapse of a lobe or part of a lobe seems the explanation of certainly some of the examples of epituberculosis. The X-ray picture is very suggestive, and the fact that, after a varying period of time, the lung condition may clear quite rapidly is confirmatory. In H. C. Cameron’s⁹ case, for instance, the physical signs in the lungs cleared completely between two examinations five days apart. Morlock and Pinchin support this view (*Plate XXI*). The collapse of lung, on this hypothesis, is due to pressure on a bronchus by a tuberculous gland, though a similar picture might be brought about by other enlargements of the glands or by a foreign body.

2. *Non-tuberculous Infiltration*.—Another suggested explanation is that of a non-specific infiltration of the lung in the immediate vicinity of a tuberculous gland, in which case it may be looked upon as an allergic phenomenon. Instances have been reported in which the condition of epituberculosis has occurred after an injection of tuberculin, but such a result might as well be attributed to changes in the tuberculous gland causing pressure on a bronchus as to a benign or allergic infiltration of the lung surrounding the gland.

3. *Tuberculous Infiltration*.—Some authors have regarded the condition of the affected lung as one of tuberculous infiltration, either by spread from the gland or by the ulcerating of caseous material into the bronchial lumen. Tuberculous material has been obtained from the central part of the affected area by acupuncture, and J. C. Spence,⁶ by passing a needle into the peripheral part, also obtained tubercle-positive material. With this evidence he is prompted to raise the question whether the outlook in pulmonary tuberculosis in small children is as bad as it is usually held to be.

4. *Mediastinal Effusion*.—Although the clinical physical signs are often suggestive, it seems clear that the presence of an effusion does not account for epituberculosis.

5. *Unresolved Pneumonia*.—This appears negatived by the absence of cough, sputum, and any tendency to the development of bronchiectasis.

To sum up, the evidence seems to favour the view that the changes in the lung in epituberculosis are due to collapse secondary to pressure on a bronchus by a tuberculous gland. But we are not yet in a position to affirm that this is the invariable cause, nor perhaps can we even assume that the causative lesion is necessarily the same in all cases.

REFERENCES.—¹*Lancet*, 1933, i, 1114; ²*Jahrb. f. Kinderheilk.* 1920, xciii, 2; 1921, xciv, 102; ³*Amer. Jour. Med. Sci.* 1930, clxxx, 824; ⁴*Arch. of Pediatrics*, 1930, xlvii, 194; ⁵*Monats. f. Kinderheilk.* 1921, xxi, 447; ⁶*Arch. of Dis. Childh.* 1932, vii, 1; ⁷*Acta Ped.* 1930, x, 87; ⁸*Zeits. f. Kinderheilk.* 1922, xxxiv, 142; ⁹*Guy's Hosp. Rep.* 1932, 290.

ERYSIPELAS.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—According to F. W. Taylor¹ the onset of *erysipelas in the newborn* is insidious without the abrupt course characteristic of the disease in the adult. The infant does not seem to be acutely ill. The eruption may not appear till the second or third day, and may at first be mistaken for one of the common infantile erythemata. The local lesion is identical with that in the adult, but tends to cause a more pronounced oedema of the skin and subcutaneous tissue and to migrate to other parts of the body. The mortality is very high, ranging from 90 to 95 per cent. Complications are frequent, the commonest being cellulitis, subcutaneous abscess, gangrene of the skin (especially in erysipelas of the umbilicus), septicæmia, pneumonia, otitis media, and endocarditis.

P. Nobécourt² states that erysipelas in the newborn usually starts in the infra-umbilical region and is due to puerperal streptococcal infection in the mother. It may, however, arise in any part of the skin as in older children. The gravity of erysipelas before the age of 3 months is due to the weakness of resistance at this age, and indicates the absence of any natural resistance to this disease—in striking contrast with measles, which is exceptional before the age of 3 months, not because the infant is naturally immune to it, but because the mother who has had measles transmits to the infant a specific though transient immunity.

TREATMENT.—D. Symmers and K. M. Lewis³ state that, while in 1904–26 15,277 cases of erysipelas were treated in the Bellevue Hospital, New York, without antitoxin with a fatality rate of 10·1 per cent, 3311 cases were treated from May 1, 1927, to May 1, 1932, in the same service by routine use of **Anti-toxin** with a mortality of 7·1 per cent, or a reduction of 30 per cent in the number of deaths. The failure of antitoxin in about 5 per cent of the cases is probably due to the fact that the causal organism may be one of several strains.

REFERENCES.—¹*Arch. of Pediat.* 1932, Sept., 587; ²*Gaz. des Hôp.* 1932, Oct. 5, 1457; ³*Jour. Amer. Med. Assoc.* 1932, xcix, 1082.

PLATE XXI

EPITUBERCULOSIS

(H. V. MORLOCK AND A. J. SCOTT PINCHIN)

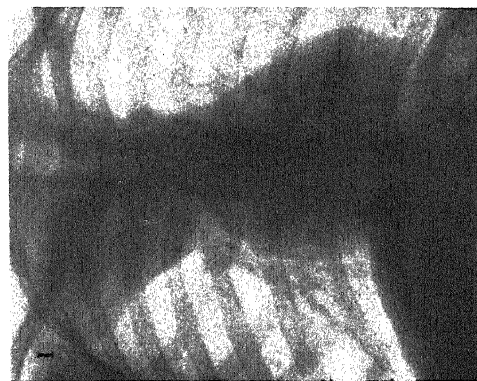


Fig. A.—Skiagram of epituberculosis.

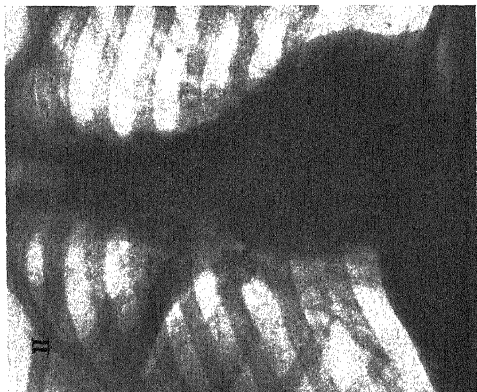


Fig. B.—Alteration in skiagram in same case following bronchoscopy.



Fig. C.—Same case two weeks later. Return of occlusion, but lower border of shadow is higher than in Fig. A.

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ERYTHEMA INFECTIOSUM.*J. D. Rolleston, M.D., F.R.C.P.*

P. Meyer¹ describes an epidemic of erythema infectiosum at Strasbourg, which started at the end of 1926 and ended in April, 1927. The symptoms and course of the disease were the same as those described in the epidemics of Graz (1890), Wetzlar (1899), Switzerland (1905, 1915, 1918), and Bordeaux (1906). Several cases in a family were rare, as in poliomyelitis, and in only one instance was more than one case detected in the same institution. As the disease was not notifiable, the exact number of cases could not be determined, but Meyer estimates that there were about 250 in a population of 170,000 inhabitants. After 1927 he did not see another case until June, 1932, when he had to treat a typical case in a girl, aged 2 years.

An excellent description of erythema infectiosum, which is also known as 'fifth disease' or 'megalythema epidemicum', is given by L. Lind.²

REFERENCES.—¹*Rev. franç. de Péd.* 1932, viii, 363; ²*Thèse de Paris*, 1932, No. 156.

ERYTHEMA NODOSUM.*J. D. Rolleston, M.D., F.R.C.P.*

P. De Diego¹ records his observations on 13 cases of erythema nodosum in children aged from 2 to 13 years, 9 of whom were boys and 4 girls. The Pirquet reaction was positive in 11, negative in 1, and in 1 the result was not given. In 11 evidence of glandular or pulmonary tuberculosis was found on radiological examination. In one case the eruption occurred a year after the first attack. According to De Diego, acute articular rheumatism does not play such an important rôle in the etiology as some think; only one of his patients gave a previous history of this disease, and that a doubtful one. He regards tuberculous infection as the most frequent, if not the only, causal factor of erythema nodosum. (But see MEDICAL ANNUAL, 1933, p. 161.)

REFERENCE.—¹*Paidoterapia*, 1932, xi, 469.

EYE AFFECTIONS. (See CATARACT; CONJUNCTIVA; MYOPIA; OPTIC NERVE, DISEASES OF; RETINA, DETACHMENT OF; VITREOUS HÆMORRHAGES, RECURRENT.)

FACIAL PARALYSIS.*Macdonald Critchley, M.D., F.R.C.P.*

Following the teaching of J. Collier, many have suspected that a proportion of cases of Bell's palsy are the effect, not of a rheumatic implication of the perineural tissues, but rather of an infection with a neuro-fixating virus of unknown nature. We see this exemplified in certain instances of cephalic tetanus, where the prominent clinical sign consists in a facial paralysis indistinguishable from that described by Bell. In the 'Ramsay Hunt syndrome'—believed to be the result of an herpetic affection of the geniculate ganglion—the outstanding signs comprise a peripheral facial palsy, tinnitus and vertigo, and a crop of vesicles within the concha and internal auditory meatus. Mild cases are known, however, where the acoustic symptoms and the herpetic rash are minimal, and the true nature of the facial paralysis may then be easily overlooked.

How many other cases of apparently simple Bell's palsy are actually variants of geniculate herpes? To answer this question R. S. Aitken and R. T. Brain¹ have investigated 22 cases of facial paralysis (regarded clinically as examples of Bell's palsy), by means of the complement-fixation test employed by S. P. Bedson and J. O. W. Bland. They found that in 4 out of the 22 cases the blood serum contained herpes zoster antibodies, suggesting that in a proportion, though certainly not the majority of cases of Bell's palsy, a virus disorder may be responsible. In a control series of 9 cases of probable

geniculate herpes, antibodies to herpes zoster were found by the complement-fixation test in all. This confirms Ramsay Hunt's views on the herpetic nature of his syndrome. It does not, however, clear up the doubt whether the geniculate ganglion really is the seat of the herpetic inflammation. Further work along these suggestive lines is awaited with interest.

REFERENCE.—¹*Lancet*, 1933, i, 19.

FACIAL PARALYSIS: SURGICAL TREATMENT.

Geoffrey Jefferson, M.S., F.R.C.S.

Reference has previously been made (MEDICAL ANNUAL, 1929, p. 312) to the direct method of repair of the facial nerve as it lies within its canal in the petrous bone. The case then referred to was Stirling Bunnell's re-suture of a facial nerve which had been accidentally divided in the course of a radical mastoid operation three months previously. The following year Sir Charles Ballance and A. B. Duel commenced their work in the latter's laboratory near New York on the repair of the experimentally divided nerve. Ballance's previous observations with L. Colledge had been concerned with facial nerve anastomosis, uniting it to the spinal accessory, the hypoglossal, and the glossopharyngeal in ascending order of merit. The objections to these anastomotic operations are three-fold; first, that another nerve injury (paralysis of the 'donor nerve') is added to that previously existing; second, that associated movements are inevitable and unsightly. This is a matter of little or no importance in the case of the glossopharyngeal, but it has led to grotesque results when the spinal accessory has been employed. Granting the exceptional suitability on these grounds of the glossopharyngeal nerve, there is a third objection yet, and that is the lack of emotional movement of the face and of good facial symmetry in repose. Here, as elsewhere, imitations cannot replace the real thing, and for that reason Ballance and Duel set themselves once more to the problem of surgical repair of the facial nerve within its bony canal. Not only were the experiments most promising, but Duel¹ reports two successful grafts in human cases.

The graft question is somewhat different from Bunnell's original secondary suture of the divided ends directly to one another. The idea has grown up in England, largely as the result of Platt and Stopford's work on war material, that nerve-grafts are of little use. French workers, on the other hand, are much more optimistic, and Duel's results certainly support them. He has been impressed with the rapidity of recovery once the first signs of returning function in the facial muscles put in an appearance. He calls the final recovery 'tumultuous', no matter how long the delay beforehand. As the result of studies on this point, Duel concludes that the grafts are more easily penetrated by axons if the nerve from which the graft is to be taken is first divided and allowed to degenerate *in situ* for three weeks. This period of time allows of the clearing of the axonal sheaths by Wallerian degeneration, and the facial nerve-fibres now meet with no resistance when they come to permeate the graft, and pass on to the distal, already degenerated, peripheral end of the facial nerve. Whether this is a fundamental point of importance is not yet knowable, but certainly anything which improves the usefulness of an inlay graft is worth trying. An interesting observation was made as a side issue, and that was the very rapid appearance of the reaction of degeneration in the paralysed facial muscles. In man it has been thought that a week or ten days are necessary for the disappearance of faradic excitability, but in Duel and Ballance's monkeys it disappeared in 24 hours in 8 cases, in 60 to 72 hours in 11, in 96 hours in 2, and only in 1 did it delay as long as 9 days.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1933. Feb., 382.

F. W. Watkyn-Thomas, F.R.C.S.

A most importance advance in this subject has been made by Sir Charles Ballance and A. B. Duel.¹ Anastomosis operations, such as joining the lower end of the facial to the trunk of the hypoglossal or spinal accessory, have never been completely satisfactory owing to the associated movements from the innervation field of the 'trunk' nerve, and also to the irregular control of the 'automatic-associated' movements of the facial nerve itself. According to Ramsay Hunt² the exaggerated movements are due largely to the fact that the 'automatic-associated' movements, including all expressions of emotion, are governed by 'paleo-kinetic' fibres from the extrapyramidal tracts, and these fibres are much less delicate and recover more easily than the 'neo-kinetic' fibres from the pyramidal tracts, which are responsible for isolated-synergic movements.

Ballance and Duel have now succeeded in direct repair of the facial nerve by grafting. A radical mastoid operation is done, with free removal of the bony wall and floor of the meatus. The dissection is carried into the neck and the stylomastoid foramen is exposed. Bone is then chiselled away from the foramen to the 'bend' between the oval window and the bulge of the external canal. The sheath of the nerve is freed at the stylomastoid foramen and is slit up. If the nerve is severely damaged, the injured portion is excised by two clean cuts with a fine cataract knife. In the experimental work on monkeys and in the first human case a graft of the external respiratory nerve was laid between the two cut ends and secured by a thread stitch, but in the later cases A. B. Duel³ used grafts from an intercostal nerve, as he found that a thin graft could be nourished by seepage until it became vascularized, and so was not so liable to degeneration. It was also found that much longer grafts (15 to 40 mm.) were needed in human patients than in animals. The graft is covered by a layer of gold leaf or of platinum foil.

Twelve cases are now reported. In most of them the time that has elapsed since operation is too short to estimate the final result; but in four there has been nearly complete recovery. In one case there was bilateral Bell's palsy. Here the nerves were exposed on both sides and the sheaths were slit up; five months later recovery was nearly complete. In another case a splinter of bone was found to have been driven into the nerve at a mastoid operation. Here, again, without grafting, an equally successful result was obtained. The indications are given with precision. When facial paralysis follows operative injury or suppurative disease the operation for exposure and grafting should be performed without delay. If possible, operation should be done before atrophy of the facial muscles has begun. Peripheral nerve anastomosis should be reserved for cases where there is extensive damage to bone, such as fractures of the petrous or tuberculous osteitis. A report on progress is to appear during next year.

REFERENCES.—¹*Arch. of Otolaryngol.* 1932, Jan., 1; ²*Laryngoscope*, 1932, xlii, 641; ³*Arch. of Otolaryngol.* 1932, Dec., 767.

FIBROIDS, UTERINE. (See UTERUS, FIBROIDS OF.)

FIFTH DISEASE. (See ERYTHEMA INFECTIONOSUM.)

FILARIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—The transmission of *Wuchereria bancrofti* in Sierra Leone has been investigated by E. P. Hicks¹ by feeding laboratory-bred mosquitoes on infected patients, with the result that *A. costalis* and *funestus* both allowed of complete development of the larvæ and were also found infected in nature, so they are regarded as important carriers. *A. squamosus* is also a potential

carrier but is rare in Sierra Leone, but *A. rhodesiensis* and *S. fasciata* appear to be doubtful or negative as carriers. The incidence of filariasis in North Travancore in S.W. India has been studied by M. O. T. Iyengar,² who thinks the causative filaria more closely resembles *F. malaya* of Brug than *W. bancrofti*, and he found *Mansonella annuliferus* to be the chief transmitter, but *Culex fatigans* was negative both experimentally and in nature. The same writer³ reports on filariasis at Trivendrum, also in the extreme south of India in the Travancore State, where *W. bancrofti* was found as microfilaria in 10.5 per cent of the people, particularly in the low-lying central parts of the town, with 70 per mille morbidity, especially as elephantiasis. The microfilaria rate rises with age up to 25 years only. *Culex fatigans* is the carrier.

Secondary bacterial infections have been further reported on by A. W. and F. B. Grace and S. Warren⁴ as the result of their prolonged studies in the West Indian area, and they record an interesting comparison between the incidence of suppurative conditions in Jamaica with very low filarial incidence and in British Guiana with very high such incidence. In the former area they only found non-hæmolytic streptococci in 6 out of 100 abscesses, while lymphangitis and elephantiasis are both very rare. On the other hand, in filarial-infected British Guiana the microfilaria and streptococcal rates are 23.1 and 33.2 per cent respectively, against only nil and 6.0 per cent in Jamaica, and intramuscular abscesses are practically unknown. The nature of the relationship between *Wauchereria bancrofti* and the non-hæmolytic streptococcus is obscure, but histological and bacteriological studies of elephantiasis support the view that the disease is associated with the presence of many minute foci of the non-hæmolytic streptococcus in the corium. G. Giglioli⁵ supports the view of O'Connor that pyogenic organisms in filarial disease are only secondary infections, on the strength of having failed to produce a fixation abscess in a case of elephantiasis by injecting sterile turpentine into the affected limb during a febrile attack.

The duration of the life of filarial embryos is discussed by S. S. Rao,⁶ who records two instructive cases in which the embryos ceased to appear in the peripheral blood about seventy days after excision of cysts with the adult worms, so he regards that time as the duration of the life of the embryos. H. P. Froes⁷ reports having found the microfilaria of a *Wauchereria bancrofti* infection in a non-chylous ascitic fluid of a patient in Brazil.

H. W. Acton and S. S. Rao⁸ write further on the pathology of filarial elephantiasis and deal with clinical conditions liable to be mistaken for it, including dermatolysis and hypopituitarism. Cases watched for about ten years show that filarial infections may exist for a long time without apparent clinical signs, although eosinophilia indicates the presence of a toxin, which first produces static œdema. Where the infection is heaviest, as in Cochin, elephantiasis of the extremities is common as the result of repeated attacks of lymphangitis and increasing lymphatic obstruction.

Complement fixation with antigen extracts of *Dirofilaria immitis* of dogs is reported on by R. B. Lloyd and S. N. Chandra,⁹ of the Calcutta School of Tropical Medicine. In a series of 89 cases of *W. bancrofti* infection 23 positive reactions were obtained, an analysis of which brought out the fact that in cases of chronic elephantiasis, with lymphatic obstruction cutting off the filaria toxins from the general circulation, the reaction is negative; and that cases of acute or sub-acute lymphangitis are divided by the test into a toxic-reacting class characterized by eosinophilia with normal total and percentage of polymorphonuclear leucocytes, and a non-reacting class with an eosinophilia, but accompanied by a polynuclear leucocytosis indicating septic complication. Moreover, repeated examinations showed that the reaction becomes negative

as an attack of toxic lymphangitis passes off, and it also disappeared in two cases in which surgical measures had removed a cyst containing adult filariæ and the fluid of a hydrocele respectively. They therefore suggest that the preliminary immunity response to a *W. bancrofti* infection is anaphylaxis plus an eosinophilia, and in cases with large releases of filarial toxin a positive complement fixation is added. Three of four guinea-worm cases gave positive reactions. Toxic-reacting cases are not likely to benefit from vaccines.

REFERENCES.—¹*Ann. Trop. Med. and Parasitol.* 1932, Oct. 29, 407; ²*Ind. Jour. Med. Research*, 1932, Oct., 671; ³*Ibid.* 1932, April, 921; ⁴*Amer. Jour. Trop. Med.* 1932, Nov., 493; ⁵*Trans. Roy. Soc. Trop. Med.* 1933, Jan. 31, 379; ⁶*Ind. Med. Gaz.* 1933, Jan., 3; ⁷*Jour. Trop. Med. and Hyg.* 1933, Jan. 2, 6; ⁸*Ind. Med. Gaz.* 1933, June, 305; ⁹*Ind. Jour. Med. Research*, 1933, April, 1197.

FINGERS. (See HAND.)

FISTULÆ. (See ANUS, FISTULA OF; CYSTS AND FISTULÆ.)

FOETOR ORIS. (See HALITOSIS.)

FOOD AND THE PUBLIC HEALTH.

G. E. Oates, M.D., M.R.C.P., D.P.H.

The Significance of Vitamins.—Knowledge on the subject of vitamins rapidly extends, and it is inevitable that considerable differences of opinion should exist on the various practical aspects. L. J. Harris^{1, 2} discusses the various difficulties in the light of recent researches, and his views may be summarized as follows:—

Vitamin A.—It has been claimed that vitamin A reduces mortality in puerperal septicæmia and in measles. It has been found difficult to reinforce these claims, and clinical investigations by many workers have shown that vitamin A therapy has failed to have any effect as a prophylactic in respiratory diseases, in the common cold of infants, on the incidence of common infections generally, or in the treatment of pneumonia. Vitamin A has no effect on the spread of experimental tuberculous disease. In human beings dead from the most varied types of infectious diseases there may be abundant reserves of vitamin A in the organs. The local infections to which vitamin A deficiency gives rise are of a quite special type, being caused by the structural breakdown of membranes. These scattered localized infections are restricted in origin to the abnormal membrane, and are set up by chance micro-organisms which would normally prove non-pathogenic.

There is, none the less, full evidence to show that lack of vitamin A leads to specific ill effects. The infant receives but a limited amount in utero and in its mother's milk, so that the need for ample provision of this factor, *especially at weaning*, becomes all the more apparent. Vitamin A is found in most animal fats (except lard) and in fish oils; but carotene, which is of equal biological value and is converted into vitamin A in the body, is as readily accessible in green vegetables, carrots, etc. With a well-balanced diet separate dosage with vitamin A cannot be regarded as imperative, but merely as an additional safeguard.

Vitamin B Complex.—There would seem to be little evidence of any serious lack of vitamin B in this country or the U.S.A. Recent experiments on large groups of infants in America suggest, however, that sources of extra vitamin B added to the diet may favourably affect growth. Intestinal stasis and lack of alimentary tone is admittedly one effect of vitamin B deficiency, but there is no compelling evidence for the widely advocated theory that the prevalence of constipation in this country is due to vitamin B shortage.

Vitamin D.—In temperate parts of the world, where the intensity of the ultra-violet radiation which can strike the surface of the body is much reduced, it would appear that the common food-stuffs do not contain sufficient supplies of the anti-rachitic vitamin. It is therefore essential to supplement these supplies artificially. This applies equally to breast-fed babies, since breast milk is in itself an inadequate and uncertain anti-rachitic agent. Cod-liver oil has proved a sterling remedy in the past, but has the disadvantage that it may be impracticable to give enough to ensure full protection in every case. Experience shows that the most certain remedy is irradiated ergosterol. From a practical standpoint, however, it is sometimes an advantage to use a food (such as dried milk) in which the requisite proportion of irradiated ergosterol has been incorporated. Ultra-violet irradiation gives good results in individual cases, but is difficult to apply prophylactically on a large scale. Halibut-liver oil, which is very rich in vitamin D, promises to be of great value.

For curative treatment irradiated ergosterol is the method of choice, but great care must be taken not to cause hypervitaminosis from overdosage. Contrary to what is often supposed, the toxic dose for the human being is close to the optimum or curative dose (only three or four times greater). A dose of 1500 international units a day is provisionally recommended for ordinary prophylactic use, and 3000 to 5000 units for curative treatment. There is evidence that 10,000 units is on the borderline for hypervitaminosis.

The Vitamin Content of Butter.—In this country butter is the chief supply of vitamins A and D to the population. Other foods may be richer in one or other constituent or in both, but none is so universally consumed. It is therefore highly satisfactory to learn from M. E. F. Crawford and others³ that Australian and New Zealand butters, which are so largely eaten in this country, contain both vitamin A and vitamin D, after reaching these shores, to a value as high as that of butters produced in Great Britain or elsewhere in Europe. It is known that the vitamin content, and especially the vitamin D content, of milk and butter produced in northern latitudes declines in winter, when sunlight is deficient and the herds are stall-fed, and that it rises again in the summer. The Australian and New Zealand butters do not at any time of the year fall short of the best summer butters here, or even of butters produced from cows whose diet has been fortified by an artificial supply of the fat-soluble vitamins A and D. There is no significant loss of either vitamin A or D when butter is kept in cold storage for a period of five to ten months. A point of practical importance lies in the fact that the British population has available in imported butter a valuable source of vitamins during the winter season, when the vitamin potency of home and other European butters may be low. (See also VITAMINS.)

The Cost of an Adequate Diet.—G. P. Crowden⁴ has collected information from various sources in order to determine the minimum cost of providing an adequate, well-balanced, varied, and physiologically sound diet per unit man-value per week, and, with this figure as a basis, the minimum cost of adequate food per week for families of varying size has been calculated. In April, 1932, the sum of 7s. per week per man-value was estimated by him to be the absolute minimum of expenditure on food under the best possible conditions of household management and economic purchasing by the mother. At the present time this figure would be reduced by a few pence owing to the fall in the cost of food. In such calculations it is customary to take the man-value of the various members of the family according to a scale devised by E. P. Cathcart and A. M. T. Murray.⁵ For instance, a woman's coefficient is 0.83 compared with a man's 1.00, a child of 8–10 is 0.7, a child of 1–2 is 0.3, and so on.

In the *Week-end Review* for April 1, 1933, a committee of experts reports that the cheapest diet suitable *on paper* for an adult male not engaged in muscular work costs 3s. 2½d. per week, but digestive, culinary, and psychological considerations rule it out for practical purposes. The cheapest *practical* diet in current English urban conditions costs about 5s. for adult males not doing muscular work.

G. C. M. McGonigle made investigations in Stockton-on-Tees during 1932 into the economic and health conditions of comparable groups of families, poverty-stricken owing to unemployment, and residing in slum areas and in municipal housing estates respectively. He finds⁶ that the death-rate of the transferred population is increased, the main causes of death showing an increase being measles, cancer, heart conditions, and respiratory diseases. Tuberculosis showed a decrease. The only discovered adverse influence operative on the transferred population was a diminution in the expenditure on food. In the slum area the unemployed family was found to spend about 3s. 9½d. per man-value on food, but on the municipal estate this became reduced to 2s. 10½d. This may be explained by the fact that the average rents paid was 6s. 8d. in the slum area and 9s. 6d. on the municipal estate.

From the evidence adduced above it may be inferred that great caution should be exercised in rehousing families existing at a low subsistence level. They may be living in rent-restricted houses, and if forced to pay a higher rent the subsistence level may be further depressed, with disastrous effects on nutrition.

Enteric Fever Spread by Cooked Meat.—The enteric group of fevers is water-borne mainly, but other vehicles of infection besides water and ice are milk, ice cream, shellfish, and uncooked greenstuff. A. Massey⁷ describes an outbreak of typhoid fever in Coventry, the origin of the outbreak having been a mild antecedent case in the person of the proprietor of a shop selling food-stuffs. On strong circumstantial evidence, the general vehicles of infection were deemed to be cut slices of boiled ham and pressed beef. It appeared that 11 persons were infected by this means, while 4 persons became infected by direct contagion from previous cases. The source of infection in the original case was not ascertainable. The man in question on recovery from a very mild attack resumed work and handled the food on sale in his shop. This particular type of food-stuff is an unusual vehicle of infection in typhoid or paratyphoid outbreaks, but a few instances have been recorded in England in recent years. A minor outbreak at Egham in 1928 was traced to cold tongue supplied from an infected household. More commonly, cooked meats are incriminated as vehicles of living bacilli of the *Salmonella* group, causing one type of bacterial food poisoning.

REFERENCES.—¹*Brit. Med. Jour.* 1933, ii, 231; ²*Ibid.* 367; ³*Med. Research Council. Special Report* 175, 1932. H.M. Stationery Office; ⁴*Lancet*, 1932, i, 899; ⁵*Med. Research Council. Special Report* 151, 1931; ⁶*Proc. Roy. Soc. Med.* 1933, April, 677; ⁷*Medical Officer*, 1933, July 15, 25.

FOREIGN BODIES IN THE BRAIN.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Occasionally a bullet or other foreign body may enter the brain without the knowledge of the patient. The reviewer¹ recorded the details of a case of a patient aged 21 who thought he had received a small scalp wound in some street fighting. He was dressed and not detained in the hospital. No X-ray was taken. He noticed at the time of his wound sounds of music in his ears as if there was a band with drums in close proximity. About twice a month for four years a black dot appeared in his right lateral field of vision. This finally became a blinding light in the centre of his visual field. At this stage he

became totally blind. He never lost consciousness, but his memory was stimulated and distorted. Headaches and vomiting supervened. In the intervals he was well and led an energetic life, but the reappearance of the black spot when least expected, like the ghost in *Hamlet*, left him morbid and alarmed. There was no paralysis, no alterations in the reflexes, and both fundi were normal. X-ray examination disclosed the fact that the nickel case of part of a conical bullet was lying in the base of the brain just behind the petrous portion of the temporal bone at the level of the eminence in the superior semicircular canal (*Plate XXII*). Removal of the bullet was followed by complete recovery. The area involved was the 'association area' which lies between the visual area behind and the portion of the brain concerned with hearing in front. It may be surmised that the association area in the brain from which the foreign body was extracted is one of the resting places of the intellect, which brings to memory hearing and sight. It is the development of such a centre (absent at birth) which accounts for the fact that Beethoven was able to write and conduct his symphonies at a time when he was overwhelmed with deafness and deprived of the faculty of which he stood most in need.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1933, Feb. 15, 278.

FOREIGN BODIES, SMALL, IN THE EXTREMITIES.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Foreign bodies, such as sewing needles, pieces of broken glass, and chips of steel, gain easy entrance to the hands and feet. Every experienced surgeon realizes the difficulties which may arise in their location and removal.



Fig. 37.—Photographic view of localizing pins inserted at right angles to each other into small portion of epidermis of left thumb.

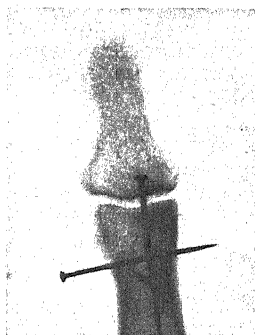


Fig. 38.—Perpendicular X-ray view with localizing pins in place.

R. W. McNeal and J. D. Willems¹ remind us that in muscle tissue these foreign bodies may do little harm. When they are located in or near tendons or ligaments of the hands or fingers they become painful and interfere with movement. The

PLATE XXII

FOREIGN BODY IN THE BRAIN

(SIR W. I. DE C. WHEELER)



Lateral and anteroposterior views of patient with bullet in the 'association area' of the brain.

*By kind permission of
'Surgery, Gynaecology and Obstetrics'*

wound of entrance is frequently insignificant. The direction in which the foreign body proceeded is even more difficult to establish. None the less its exact location must be established. For this purpose two ordinary needles or pins are passed through small portions of the epidermis in such a way that the pins cross each other at right angles, the points of crossing corresponding to the position where the foreign body is supposed to lie. These pins penetrate only the horny layer and cause no pain (*Fig. 37*). The next step is to take two X-ray views with the pins in place. One of these views is looking down perpendicularly on the point of crossing of the pins (*Fig. 38*), the other view is taken so that one of the pins, preferably the transverse, shows in silhouette at a single point (*Fig. 39*). If both these views are accurately and carefully taken in this way, the visualization of the position and exact location of the foreign body becomes a simple matter. We see that in *Fig. 38* the foreign body crosses the pointed limb of the longitudinal pin about 4 mm. from the crossing of the pins; half of it lies in the lower left quadrant and the other half in the lower right quadrant. In *Fig. 39* we notice that the least distance between the pin and the foreign body is about 3 mm., giving us the exact knowledge of the depth at which it lies. Furthermore, the combination of both these views demonstrates to us the direction of the long axis of the foreign body. By this procedure it becomes an easy matter to visualize exactly the spot at which to make the incision. It becomes, in fact, more difficult to miss the object than to find it at the first attempt. The Esmarch constrictor should be used so that the foreign body cannot be obscured by blood. The pins are removed when the surgeon is ready to make the incision and after he has the exact location where the incision will lay bare the foreign body. Gas-oxygen anaesthesia is probably the best.

REFERENCE.—*Amer. Jour. Surg.* 1932, Nov., 267.

FRACTURES AND DISLOCATIONS. (See also BENNETT'S FRACTURE OF THE THUMB; SPINE, AFFECTIONS OF.)

E. W. Hey Groves, M.S., F.R.C.S.

The Treatment of Open Fractures.—The treatment of open fractures still remains one of the most important practical surgical problems of the day. In the first place, however, before discussing any particular method, the greatest stress must be laid upon the conditions under which the case is to be treated. These may be one of three kinds: (1) Home conditions or in



Fig. 39.—Silhouette X-ray view of foreign body in extensor tendon of left thumb, localized by crossed pins inserted into small portion of epidermis.

(Figs 37-39 by kind permission of the *American Journal of Surgery*.)

a cottage hospital; (2) At a general hospital where the case is only one of many other surgical cases, and there is no special fracture team or specialist; and (3) Where the case is admitted to a special fracture hospital or fracture department with a team of surgeons and nurses ready to carry out any special treatment. Under the first of these conditions, it is unwise to attempt anything in the nature of elaborate treatment. Thorough cleansing of the wound under an anæsthetic, and firm fixation on a splint or with plaster, should be done without delay and the case transferred to a fracture clinic. The same really applies to the second set of conditions, but here in a general surgical ward there is no reason why perfect treatment should not be begun and carried through. Unfortunately, however, this is often not done, and the patient suffers the misfortune of ineffective treatment by an inexperienced house surgeon, or the tragedy of undergoing spectacular treatment by one of the surgeons who 'plates' the fracture and sends the patient away next week to a municipal hospital, where subsequent amputation takes place.

One of the very great advantages of **Winnett Orr's Method** of treatment (wound cleansing, open vaseline pack, perfect alinement and fixation by pins and plaster applied under traction, and closed plaster case) is that it requires very little special apparatus or technical skill. Moreover, within a week of being put up, the patient can be sent home or to a country hospital. We are firmly convinced that this method represents by far the best routine way of treating compound fractures. It may not always succeed, but it combines the best chance of success with the least risk of doing harm.

There are, however, other methods advocated and practised with brilliant success, and of these the most notable is the **Sherman Method**, in which fixation by plates and screws is used whenever possible. But it must not be forgotten that Sherman and his assistants working for the Carnegie Steel Company in Pittsburgh have organized a perfect team system and co-operative technique without which their results would have been impossible of achievement. There is very real danger of their teaching being misunderstood, and their example being followed by those who forget that organized team work is essential for its success.

G. V. Foster¹ has given a most interesting account of 304 cases of compound fractures of the long bones treated in the Sherman clinic during a period of fifteen years (1917-32). Treatment is always begun within ten hours of the accident, and consists in the first place of thorough excision and cleansing of the wound (débridement) with subsequent continuous irrigation by the Carrel-Dakin technique. Even if the accident occurs at some outlying station, this first stage of treatment is carried out with all the meticulous care of a major operation, and the patient, properly splinted, is transferred to the central hospital. The final treatment is carried out in the latter institution, where the patient is kept until he is fit for work. The fixation of the fracture is by one of three methods: (1) When great comminution of the bone is present skeletal traction is applied by a wire or by ice-tongs caliper; (2) In the absence of comminution the main bone fragments are fixed by a plate and screws, but the wound is not closed, the Carrel-Dakin irrigation being continued; (3) When the wound is trivial, it is allowed to heal, and then secondary plating is done through a separate incision. It is interesting to note the number of cases treated by these three methods of fixation: 175 were treated by traction, 58 by primary plating, and 71 by secondary plating. It is seen, therefore, that even with these enthusiasts for plates, only 19 per cent of the cases were suitable for primary plating. Of the whole number of 304 cases, good results were obtained in no fewer than 301, as judged by the test of being able to return to strenuous work. In only 9 cases did non-union occur, and in all

these bone-grafting was done. Plates and screws are generally removed when bony union is complete. The general methods of treatment have remained essentially the same during the whole period of fifteen years; but it is noted that skeletal traction has now superseded that by adhesive appliances, that active movements are instituted at an earlier period, and that the use of diathermy has been abandoned.

Fractures and Dislocations of the Elbow.—These injuries, which are so common, frequently give rise to doubt and anxiety in regard to the best methods of treatment and the ultimate functional result. P. D. Wilson,² working in the Fracture Service of Massachusetts General Hospital, has done most useful work in collecting and analysing 352 cases of these injuries which occurred between 1924 and 1930. All the cases are followed up, and the end-results are noted under three headings. First, the anatomical result (A), second the functional (F), and third the economic or capacity for work (E). Each heading is divided into four categories (1, 2, 3, 4) representing approximately 25, 50, 75, or 100 per cent of perfection respectively. Such a system of follow-up and grading seems so excellent that it ought to be instituted in every fracture clinic. The *supracondylar fractures* were the most frequent form of injury. These were usually treated by flexion after the displacement had been reduced by traction and manipulation. The arm is put up with a sling without splinting or strapping. If ischæmia is threatened as indicated by failure of the radial pulse when the arm is flexed, it can usually be averted by appropriate means. These consist in allowing the arm to rest with the elbow at a right angle and elevated above the shoulder. If much swelling of the elbow exists, then operation affords the best means of averting the danger of ischæmia. Several incisions are made into the soft tissues through the deep fascia, and blood-clot is evacuated. In one case it was possible to disentangle the brachial vessels from the pressure of the bone fragments. In borderline cases where much swelling exists, the best method of treatment is to apply traction by means of a small pin or Kirschner's wire through the olecranon. The elbow is kept at a right angle, the forearm being slung vertically. This same method of treatment is also indicated in *T-shaped condylar fractures into the joint*. Wilson refers to open operation and plating as being necessary in many of the T fractures with much displacement, but he admits that this treatment is difficult and unsatisfactory. *Fractures either of the medial epicondyle or of the capitellum* are often accompanied by marked rotatory displacement of the fragment. These should always be exposed by open operation and the fragment fixed by chromic catgut.

Fractures of the head and neck of the radius give a surprisingly large proportion of bad functional results. It is wise, therefore, to treat such cases by early removal of the broken fragment or by excision of the radial head.

Dislocation of the head of the radius with fracture of the shaft of the ulna is a fairly common injury, and always requires immediate operative treatment. Manipulation and traction can never make good the displacement nor keep the radial head in position. Either the orbicular ligament is torn or the radial head has been pulled out from its embrace, and under neither of these circumstances can the head of the radius be fixed in proper position unless the ligament is adjusted and sutured. The fractured ulna must be fixed by a plate at the same time.

Wilson does not refer to those cases of this injury where the displacement has been allowed to persist. Such a condition will cause a painful fixation of the elbow with loss of rotation of the hand. Two methods of treatment are possible—either: (1) Excision of the head and neck of the radius, which will mobilize the elbow but produce a weak arm; or (2) Refracture of the ulna

and fixing it by a peg or a bone-graft, the radial head being tied into the lesser sigmoid notch of the ulna by means of a silk suture or a sling of fascia.

Fractures of the Neck of the Humerus.—Complicated fractures of the humeral neck are always very difficult to treat with any prospect of good functional result. Fragmentation of the head, dislocation, and the separation of the great tuberosity are the common complications which may occur and which are very liable to lead to a stiff and painful shoulder. In most cases of such injuries the choice of treatment will consist in keeping the arm on an abduction splint, or in deliberately doing an arthrodesis in the position of abduction. By either of these methods fixation of the shoulder will be compensated by the scapular movements.

Laurence Jones³ has now suggested a new method of dealing with these cases which he has employed successfully (*Figs. 40, 41*). The head of the humerus is excised through an anterior or external incision. The tendons of the short rotators (subscapularis, supra- and infra-spinatus and teres minor)

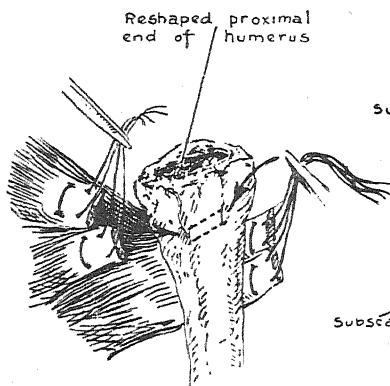


Fig. 40.—Diagrammatic illustration of reshaped head and tendinous preparation.

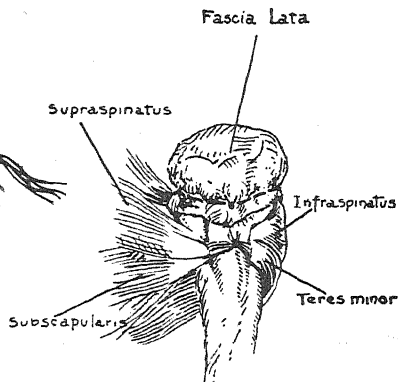


Fig. 41.—Diagram illustrating the application of the fascial flap and the completed muscle transplants.

(*Figs. 40, 41 by kind permission of 'Annals of Surgery'.*)

are carefully separated from their insertions into the bone. The shaft of the bone is smoothed, rounded, and covered by a free fascia transplant. The tendons of the short muscles are fixed to the shaft of the bone by suitably placed grooves and drill holes. The arm is put up afterwards on an aeroplane splint. The idea contained in this suggestion seems to us very good. Possibly it would be an improvement if the two groups of short tendons were chipped off the humerus with a fragment of bone attached to each. This bone tubercle could then easily be fixed to the neck of the shaft by a nail or by a suture going right through the bone.

Fractures about the Ankle-joint.—One of the most important complications or varieties of Pott's fracture is that which involves a separation of the posterior articular margin of the tibia. This type of fracture is always associated with marked posterior dislocation of the ankle. In the ordinary manipulation of a Pott's fracture, the operator stands in front of the patient and is apt to concentrate his attention on correcting the lateral deviation. Even if the foot is brought forward at the time of manipulation, it is very liable to slip back again, and for this reason it is of extreme importance to

check the result by means of a lateral X-ray after the foot has been fixed in its plaster case.

F. Dickson¹ discusses the treatment of these posterior marginal tibial fractures. He divides them into three groups. In the first are cases seen at a short period after the accident. In these completeness of reduction as checked by X rays, and placing the whole leg in plaster (the knee being flexed to relax the tendo Achillis), is the method. In the second are cases in which the posterior displacement has only been recognized or has recurred after a few weeks. In these a Kirschner's wire is passed through the astragalus, and skeletal traction made on the foot in a forward direction for three weeks. In the last group of old unreduced cases treatment of some sort is urgently required, because the patient is left with an ankle in an equinus position which is so painful as to make walking difficult. Dickson suggests that in these cases an open reconstructive operation should be done. He admits, however, that this is difficult and that the final resort must be an arthrodesis. This would certainly apply to the condition when found in elderly patients.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1933, Feb., 529; ²*Ibid.* 335; ³*Ann. of Surg.* 1933, Feb., 217; ⁴*Surg. Gynecol. and Obst.* 1933, Feb., 522.

FUNGOUS AFFECTIONS OF THE SKIN. (*See SKIN, FUNGOUS AFFECTIONS OF.*)

FURUNCULOSIS. (*See SKIN, PYOGENIC INFECTIONS OF.*)

GALL-BLADDER. (*See also CHOLECYSTITIS.*)

GALL-BLADDER AND BILE-PASSAGES, SURGERY OF. (*See also ABDOMINAL SURGERY, MISCELLANEOUS—INCISIONS AND THEIR CLOSURE.*)

A. Rendle Short, M.D., F.R.C.S.

Pre-operative Examination and Treatment.—A. F. Hurst¹ draws attention to the value of obtaining a specimen of bile by the duodenal tube after injection of magnesium sulphate. The presence of excess of mucus, epithelial debris, and pus cells indicates active cholecystitis, cholesterol crystals point to stone, and yellow lipid material to a strawberry gall-bladder. A cholecystogram would be more valuable if the radiographer elicited tenderness by palpation over the gall-bladder. Cholecystitis can be alleviated by big doses of **Hexamine** (100 gr. three times a day with 60 gr. each of **Sodium Citrate** and **Sodium Bicarbonate**), and drainage promoted by giving on an empty stomach the largest dose of **Magnesium Sulphate** that can be taken without causing diarrhoea. These treatments ought also to be used after the operation, from the first day, for two or three weeks.

The tendency to bleed in jaundiced patients can often be foretold by a rapid sedimentation rate, according to H. M. Chute and J. R. Veal,² confirming the work of Linton. The test is of far greater value than an estimation of the coagulation time, which indeed is nearly useless.

E. R. Flint³ also lays stress on the importance of pre-operative treatment, especially bed, water, **Glucose**, and in jaundiced cases **Calcium**, or better, a **Blood Transfusion**. The main causes of death are peritonitis, lung complications, cholangitis (the latter especially in common-duct cases), and myocardial degeneration.

Cholecystitis.—H. J. McCurrah,⁴ in the course of an excellent review of modern literature on cholecystitis, makes an interesting observation that the horse, rhinoceros, camel, deer, elephant, and rat have no gall-bladder; in the giraffe it is sometimes present, sometimes absent. Nor do species that lack a gall-bladder appear to have any functional equivalent. Gall-stones

have been produced experimentally by A. L. Wilkie by injecting streptococci derived from the cystic lymph-gland into the wall of the gall-bladder, but not by putting them into the lumen.

D. H. Patey and L. C. H. Whitby⁵ come to the conclusion on experimental grounds that the cystic artery is much the easiest and most probable route of infection. Infection from the liver by way of germ-laden bile is not improbable, but the ascent of bacteria from the duodenum is very unlikely.

TREATMENT.—Two writers, S. H. Mentzer,⁶ of San Francisco, and M. M. Zinninger,⁷ of Cincinnati, urge an earlier operation for acute cholecystitis. Mentzer dwells upon the quietness of the symptoms even when gangrene, empyema, or rupture of the gall-bladder is imminent, and the uncertainty what course the disease is going to take. He believes more cases are saved by early operation than by expectant treatment. In Zinninger's series of 89 acute gall-bladder cases, 35 were operated on as immediates and 3 died; two of these had been ill over five days. Of the 54 treated expectantly, only 20 settled down, and 15 definitely got worse, and were found to be suffering from empyema, gangrene, or rupture of the gall-bladder; 4 died. A high leucocyte count points to empyema. [He considers these facts are in favour of immediate operation, but on his own figures the death-rate is lower in the cases treated expectantly.—A. R. S.]

Tate Mason and J. M. Blackford⁸ have compared the end-results of the medical and surgical treatment of cholecystitis, and find that even in cases which have been advised operation and refused, medical treatment fairly often gave good results. Of 200 patients followed up for nine years, one-third were symptom free, another third came to operation, and the remaining third ought to have done so.

In order to allay a fear that in some remote part of the world they have a better way of treating disease than we have here, it is reassuring to read from time to time a thoroughly orthodox review such as that by Professor Fedoroff,⁹ of Leningrad.

Stones in the Common and Hepatic Ducts.—According to F. H. Lahey,¹⁰ stones in the common and hepatic ducts tend to occur in patients who have had stones and infection in the gall-bladder for a long time, as evidenced by the thickening and contraction so often found. They are very liable to be overlooked, because (in 39 per cent of his operated cases) there may be no jaundice at the time, and it may be impossible to palpate a stone in the ampulla of Vater. He therefore opens and explores the common duct from within, even in the absence of jaundice at the time, if there is a recent history of it, when any thickening of the duct or head of the pancreas can be felt, when the gall-bladder is thickened and contracted, and when the common duct is unduly dilated. These are excellent rules, because opening the duct adds little to the risks. In Lahey's experience the mortality in common-duct cases is higher (13.3 per cent) than when the stones are confined to the gall-bladder (4 per cent); the difference is due to septic cholangitis. The corollary is that the surgeon should intervene at an earlier date in cholelithiasis, before the stones get into the ducts.

Suppurative Cholangitis.—H. Finsterer¹¹ discusses the relative merits of external drainage of the hepatic duct, dilatation and stretching of the ampulla of Vater, and **Choledochoduodenostomy** (anastomosing the bile-duct to the duodenum) in the treatment of purulent cholangitis, which in 40 of his 42 cases was caused by obstruction by a gall-stone. He prefers the anastomosis operation, under local anæsthesia, to external drainage or to dilatation of the ampulla, and lost only 2 out of 32 patients upon whom this operation was performed, whereas he lost 3 out of 8 cases in which the duct was drained

PLATE XXIII

CHOLANGIOGRAPHY

(M. P. L. MURIZZO)

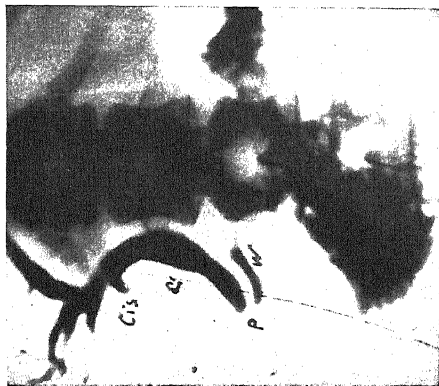


Fig. 4.—Lipiodol has been injected into the cystic duct (C15). The common bile duct (C) is filled. The opaque substance has penetrated into Wisniew's duct (W). Opaque material is visible at the level of the papilla of Vater (P), a finding of lipiodol which indicates that the papilla is contracted, preventing free drainage towards the duodenum. Ten minutes later nearly all the lipiodol had left the duct of Wisniew.

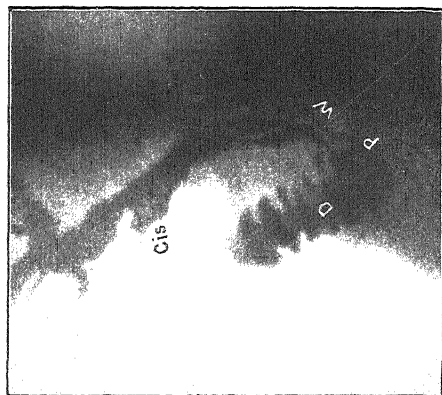


Fig. 5.—Lipiodol has been injected into the cystic duct. The trans-
lumbar portion is considerably reduced in diameter throughout its length.
Wisniew's duct (W) is injected. The papilla of Vater (P) is slightly per-
meable; some of the lipiodol has dropped into the duodenum (D).

*Plates XXVII and XXVIII by kind permission of
"Revue de Médecine de la Société nationale de Chirurgie."*

PLATE XXIV

CHOLANGIOGRAPHY—continued

(M. P. L. Minazzi)



Fig. C.—Shows a case where the gall-bladder was of a horny consistence and the sub-hepatic space was entirely blocked. The lipiodol was injected into the cystic duct by means of a No. 29 Nelaton's catheter. The filling defect (S) corresponds to a calculus the size of a nut, which was not identified by palpation. The hepatic duct (H) is enormously dilated. The common bile-duct (C), below the calculus, is filled with lipiodol.

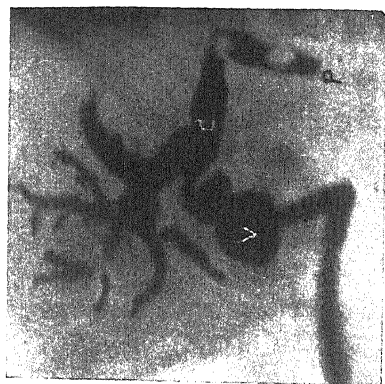


Fig. D.—Showing a blocked sub-hepatic space. The lipiodol was injected into the gall-bladder (V). The common bile-duct (C) shows in its lower third two filling defects which correspond to the size of a cherry stone, arranged in a row in the colon, which palpation failed to discover. The lipiodol does not pass beyond the papilla of Vater (P).

externally. [Probably these were unfavourable from the first.—A. R. S.] The late results of the operation also are very good. The author does not state whether the obstructing stone was always removed. He allows that in cases of short duration, where the duct wall is still thin, external drainage may be the best treatment; but if symptoms continue, the duct should be anastomosed to the duodenum at a later date.

At the Mayo Clinic¹² prolonged drainage with a T-tube, up to many months or a year, is used in infected cases (E. S. Judd and J. T. Priestley). A questionnaire was sent from the Mayo Clinic¹² to investigate the present condition of patients between twenty and twenty-five years after operation for gall-bladder trouble. Many, of course, were dead or lost sight of, but information was obtained concerning 426 patients who had had cholecystostomy, and 121 after cholecystectomy. Good results were obtained in 60 per cent after drainage, and 84 per cent after removal of the gall-bladder.

In E. Starr Judd and J. T. Priestley's series,¹² from Rochester, Minnesota, half the secondary operations necessary after cholecystostomy were for recurrent stones.

Cholangiography in the Course of Operation on the Bile-passages (Plates XXIII, XXIV).—A very interesting and suggestive paper was contributed to a French Surgical Society by M. P. L. Mirizzi,¹³ of Cordoba, Argentina. He points out that to be able to close the wound safely without drainage after cholecystectomy one must be sure of three things: that the bed of the gall-bladder on the liver is fully covered with peritoneum, that the cystic duct is 'hermetically' closed, and that the bile-ducts are permeable. The first requisite is obtained by a subperitoneal removal of the mucosa of the gall-bladder, the second by double ligature or oversewing of the cystic duct, and the third by injecting 10 c.c. of lipiodol into the cystic duct and taking a skiagram on the operating-table. If there is a gall-stone in the common duct, it will be rendered visible; if there is stenosis at the ampulla of Vater, the lipiodol will not enter the duodenum and may pass into the duct of Wirsung, and the bile-duct will be dilated. He reports 100 cholangiographies, mostly of course normal, but showing stones in the ducts in 23 cases, and 11 with stenosis due to chronic pancreatitis. The method appears to be perfectly safe.

III Effects after Gall-bladder Operations.—At an international conference on ill effects after cholecystectomy, held at Vichy in September, 1932, A. Gosset and D. Petit Dutailis¹⁴ declared that serious sequelæ were met with in from 5 to 10 per cent of the cases, and that they fall into three groups which may be sufficiently troublesome to call for another operation. They are:—

1. *Attacks of hepatic colic with jaundice*, due occasionally to a missed stone in the duct, but more often to chronic pancreatitis, or stenosis of the common bile-duct.

2. *Post-operative biliary fistula*, from pulling up and doubly dividing the hepatic and common bile-ducts.

3. *Periduodenal or pericolic adhesions*.

G. Giraud,¹⁵ of Montpellier, maintained that the post-operative troubles are not so frequently due to the cholecystectomy as to the persistence of liver complaints or infective processes that are present before and after the operation. Medical or spa treatment is called for, along the lines of regulating the diet, hydrotherapy, etc. An enormous article by I. M. Talman,¹⁶ of Leningrad, almost entirely derived from a study of the world's literature, goes into every possible source of failure of operations on the biliary passages. R. Jahiel,¹⁷ of the Salpêtrière, in Paris, publishes an account of three cases that may throw a light on some disappointments after the gall-bladder has been removed. In two of these, though nothing but adhesions were found at operation, there were

attacks of vomiting, pain, jaundice, and tenderness over the liver, both before and after operation, coming on regularly three or four days before menstruation. In one case there was anuria for a day or two. She was relieved by radium sterilization. In a third case the hepatic colic was associated with attacks of asthma.

Statistics.—S. Kjaergaard,¹⁸ reporting some Scandinavian experience, gives his own figures as follows:—

All gall-bladder operations	..	..	190 cases, mortality	7.9 per cent
Under forty	..	..	..	2
Over fifty	..	..	..	20
Common duct opened	..	..	62	12.9
Cholecystectomy	..	..	122	2.4

Of 173 cases, 13 were dead; of 160 survivors, 70.6 per cent were fully satisfactory, 20.6 had mild complications, and 8.8 per cent more severe complications. For common-duct cases the respective figures were 66.7, 16.7, and 16.6.

In a series of 347 gall-bladder operations by D. R. Goldish and M. G. Gillespie,¹⁹ of Duluth, Minnesota, there were 40 (11.5 per cent) operative deaths [This is rather high.—A. R. S.]; 62.8 per cent of those who survived were quite well, 29.4 per cent better, and 7.8 per cent not relieved.

Accidental Ligation of the Hepatic Artery.—R. R. Graham and Canwell,²⁰ of Toronto, describe a fatal case occurring in the course of an operation for cancer of the pylorus. There are 28 cases in the literature, of which 16 died; in some it was a branch that was tied. The deaths were by no means all from liver necrosis; the Toronto patient died of pneumonia.

Spasm Conditions of the Bile-passages.—A curious condition is described by L. Bérard and P. Mallet-Guy,²¹ of Lyons, which they call 'pseudolithiasis', or 'intolerant gall-bladder'. Their five cases, all women, were explored for attacks of biliary colic without jaundice; nothing was found, but the gall-bladder was drained. When on a later occasion lipiodol was injected, there was severe pain like their biliary colic, and the lipiodol rapidly filled the bile-ducts, penetrating up into the liver. In three cases the writers performed **Cholecystgastrostomy** to avoid a permanent biliary fistula; all three were cured.

V. Schmieden and H. Niessen,^{22, 23} of Frankfurt, contribute several papers describing a similar condition, in which painful contractions of the gall-bladder are attributed to spasm of the sphincters, either that of the cystic duct, or in the ampulla of Vater (Oddi's sphincter). This is not the same as 'strawberry' gall-bladder; there is no infection present. Cholecystectomy is not advised; it is better to dilate the ampulla if medical treatment fails, or an anastomosis may be made between the bile-duct and the duodenum, or a cholecystgastrostomy performed. They call the condition the 'stasis gall-bladder'.

Cases are also described under the title of *gall-bladder stasis* by O. Lambret,²⁴ which most surgeons will recognize as not infrequent. A patient, often the subject of visceroptosis, has vague symptoms such as chronic dull pain or sense of tension in the right hypochondrium, attacks of vomiting or diarrhoea, and headaches. The cholecystogram shows no stone or obstruction, but the gall-bladder is too large and too low, and takes too long to empty. At operation it is found to be large, long, and loose; in some cases there are adhesions between it and the duodenum. The author considers that these cases can often be cured by medical means, such as introducing **Magnesium Sulphate** into the duodenum. If surgery is called for, in the atonic cases, he reduces the size of the gall-bladder by invaginating the fundus; if adhesions are present, they are separated and the gall-bladder and duodenum surfaces are peritonealized. He says the results are good and permanent.

Resection of the Bile-ducts for Obstruction.—W. Walters²⁵ describes 30 cases from the Mayo clinic in which resections of parts of the common bile-duct or ampulla of Vater were carried out for obstructive jaundice due to strictures or carcinoma. The exact procedure varied: in some the duct was anastomosed, after resection, to the duodenum; in others the duct was united end to end; in a few the stricture was treated by a plastic operation, or if the hepatic duct was too short for an anastomosis, an external biliary fistula was formed and led later into the duodenum. The first method is the best, but the second may give good results also, and transplantation of a fistula was successful in four cases. Four patients died. If the liver is cirrhotic, or the ducts are thickened and septic, or granular stones are present, no operation is likely to succeed.

Cancer of the Gall-bladder.—A report on 312 cases of malignant disease of the bile-passages operated on at the Mayo Clinic is presented by E. Starr Judd and H. K. Gray.²⁶ The condition formed 1·4 per cent of the total number of gall-bladder patients. It is usually undiagnosable. Pain in the right hypochondrium, jaundice, vague gastric symptoms, and in a minority a palpable swelling constitute the clinical picture. If the disease starts in the bile-ducts, jaundice is the first sign. In 55 per cent of the cases, the condition found at operation was too advanced for any surgical treatment; in 59 patients the gall-bladder was removed; for growths of the ducts, or of the ampulla of Vater, the treatment recommended is drainage for a month or two, then resection of the growth. Mortality figures and end-results are not given. Stones were present in 64·6 per cent of the cases, and are probably a factor in the production of the cancer.

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GALL-BLADDER, FUNCTIONAL DISORDERS OF.

Robert Hutchison, M.D., F.R.C.P.

C. Newman¹ devoted his Goulstonian Lectures last year to a consideration of the physiology of the gall-bladder and its functional abnormalities. As regards the concentration of bile, he concludes that the gall-bladder concentrates the bile about ten times by the removal of water and soluble salts, the other soluble constituents being absorbed to some extent, but to a much greater degree concentrated. The mucous membrane of the normal gall-bladder and bile-ducts adds nothing to the bile but mucus. The bile-ducts dilute the bile by mucous secretion. The physiological stimulus for the expulsion of bile is the passage of food into the duodenum. It is very probable that the gall-bladder and the sphincter at the lower end of the duct are 'reciprocally innervated' so that when the bladder contracts the sphincter relaxes.

Disorders of Motility—'biliary dyskinesia'—produce pain just as distension of any other hollow viscus does, the pain resembling that of a mild attack of gall-stones. Cases of gall-stone symptoms without gall-stones, of 'cholecystitis' with a normal gall-bladder at operation, of 'hepatic neuralgia', and of return of symptoms after cholecystectomy are cases of biliary dyskinesia. There is of course, never any pyrexia.

Two varieties of dyskinesia can be recognized:—

1. *Spastic Distension*.—This is the commonest form and the easiest to cure. It is specially frequent in women of big build, and the average age at onset is about 36 years. The principal complaint is of *pain*, of a dull grinding character, coming on in spasms like colic but not so severe, and lasting for many minutes at a time. There is also a constant feeling of soreness. In distribution, the pain is located in the right upper abdomen, often in the gall-bladder area, and spreads across the abdomen, along the rib margins, becoming as severe on the left as on the right. It tends to spread through to the back, particularly to the angle of the right scapula. It is often related to tiredness or exposure to cold, or may come on an hour or two after meals. It is sometimes relieved temporarily by food. It is apt to come on in the night, like the pain of duodenal ulcer, which it resembles also in that symptoms are often intermittent, attacks of days or weeks being followed by a period of relief. Instead of pain, there is sometimes distension or a feeling of fullness after meals. *Nausea* is very common, and some patients vomit occasionally, the vomit consisting of acid food. Vomiting, if it happens, relieves the pain (as it sometimes does in gall-stone colic). A history of flatulence can be elicited, but it is seldom volunteered—that is to say, it is only slight. The *appetite* is poor, and most patients *lose weight*, sometimes seriously. The patient may look quite well, or haggard, grey, and very ill. There is often a history of slight *jaundice* during the attacks. The bowels are usually open more than once a day, less often there is constipation, with a palpable, hard, tender descending colon of the type associated by radiologists with ‘spastic constipation’.

The tongue is clean, or pale and flabby, not coated. The liver region is tender, especially over the gall-bladder, but without rigidity or a definite catch in the breath as the gall-bladder comes down on the palpating hand. The liver feels normal. There is usually a ‘soreness’ on pressure over the liver behind, which must be a skin sensation, as it is different from the tenderness in front and the ribs protect the liver from actual pressure. It is remarkable how many of the patients show extrasystoles, of which they are sometimes conscious when the attack is at its worst.

Cholecystography shows an opaque, well-filled, well-concentrating gall-bladder, of at least normal size, which diminishes after the fatty meal but does not disappear, and which shows a delay in emptying.

TREATMENT.—The treatment of spastic distension is by diet and medicine. The essentials of **Diet** are small, equal, and regular meals, the avoidance of mixtures of fats and starches, and restraint in both coarse irritating foods and over-interesting cookery. This entails taking meals at specific times, making breakfast and tea rather larger, and lunch and dinner rather smaller, and refraining absolutely from such things as buttered toast, mashed potatoes (with butter in them, that is), and ‘white sauce’. Milk puddings do not come under this interdict. Bread and butter is to be avoided, toast ‘melba’ should be substituted, without butter. It is worth while to investigate the patient’s customary diet, dislikes, and fancies carefully, and to write out a complete list of what may and may not be eaten. To avoid loss of weight, to supply the deficiency in fats, and to empty the gall-bladder during the resting period, the patient should take an ounce of butter, olive oil, or cream last thing at night. This they are usually very glad to do, because a desire for fats is natural on a diet in which it is not possible to mix fats and starches.

Medicinally the essential drug is **Belladonna**, given in the form of the tincture, starting with 10 min. three times a day after meals. The dose to aim at is one which produces a definite vagal inhibition without unpleasant

symptoms; it varies in different people and can only be found by trial, remembering that it is useless to give too little, but that the good effect of the proper dose is appreciated within a week at the outside. The belladonna is given in a mixture with sodium bicarbonate 15 gr.

2. *Atonic Distension*.—This is much rarer than the spastic form and occurs at a later age and in patients of the asthenic build. The typical clinical picture would seem to be this: The pain is a continuous, not spasmodic, heavy aching sensation. It comes on soon after meals, and radiates all over the epigastrium, but not to the back. The gall-bladder region is the point of maximal discomfort. The appetite is poor and the patient is constipated. There is always a complaint of flatulence. There may be occasional vomiting, but surprisingly little nausea (the nausea of the spastic type is possibly due to pylorospasm). There is usually tenderness in the epigastrium and over the liver region. The stomach contains very little acid and often no free hydrochloric acid. It tends to be atonic and baggy in the barium meal films, with a delayed emptying.

Cholecystography shows a very long thin gall-bladder, which throws a poor shadow and empties very little.

TREATMENT is not nearly so effective as in the spastic form. As regards **Diet**, fruit and salads are encouraged; green and root vegetables, cheese, porridge, milk puddings, and all sodden doughy foods should be avoided and meals should be taken dry. The resources of cooking tasty and appetizing food may all be encouraged. In other respects the diet is the same as for spastic distension, including the nocturnal dose of fat. It is in drugs that we are handicapped. Newman prefers **Sp. Armoracæ Co.** (1 drachm), **Ol. Ment. Pip.** ($\frac{1}{2}$ to 1 min.), and **Menthol** (1 gr. in pill). Dilute **Hydrochloric Acid** after meals is also useful. Improvement is usually gradual.

REFERENCE.—¹*Lancet*, 1933, i, 785.

GANGLION.

Sir W. I. de C. Wheeler, F.R.C.S.I.

TREATMENT.—H. Günther¹ describes a simple and successful form of treatment for a ganglion. Under the strictest aseptic precautions a small wheal is raised over the ganglion with a local anæsthetic. The ganglion is now punctured with a large-bore cannula, and the jelly-like material is removed by attaching a syringe. The syringe is then withdrawn and filled with **Collodion**. The ganglion is injected with the collodion. A tight bandage is applied to prevent sepsis, and also to prevent too great movement of the limb. In about twenty-four hours there are signs of slight inflammation, with some redness and swelling of the skin. In three days the ganglion has disappeared. In the author's hands the treatment has always been successful, and he has had no cases of recurrence.

REFERENCE.—¹*Zentralb. f. Chir.* 1932, June 11, 1476 (abstr. in *Brit. Med. Jour.* 1932, ii, 35).

GANGRENE, DIABETIC.

Sir W. I. de C. Wheeler, F.R.C.S.I.

For all practical purposes it may be assumed that neglected diabetic patients develop arteriosclerosis. Furthermore, diabetic patients resist infection badly, and if infection is present, the action of insulin and orthodox diets is to a large extent defeated.

E. L. Eliason¹ points out the danger of procrastination and conservatism in cases of moist diabetic gangrene. [The reviewer has often witnessed how inertia in these cases is mistaken for wisdom.—W. I. de C. W.] Dry heat, dry dressings, and the electric cradle are employed prior to amputation. Occasionally gas-bacillus infection enters the picture. In preparation for the operation

carbohydrates, fluids, and insulin are given under the direction of the physician. A few hours will prepare the patient in urgent cases. If the patient receives sufficient carbohydrates and the blood-sugar is controlled with insulin, acidosis will not develop. The anæsthetic chosen must not tend to produce acidosis. There is the following choice, in order of merit :—

1. *Local Anæsthesia*.—Produces no changes in metabolism and is to be preferred in all cases where minor operations are performed and in other cases that would not stand a general anæsthetic.

2. *Spinal Anæsthesia*.—Also causes no disturbance in metabolism and is the anæsthetic of choice born of necessity in operations on the lower extremities, perineum, and lower abdomen, providing there is no contra-indication due to the patient's general condition.

3. *Nitrous Oxide and Oxygen*.—Does not tend to produce severe metabolic disturbance unless unduly prolonged. Not a good anæsthetic, however, when relaxation is desired.

4. *Nitrous Oxide supplemented with Ether*.—Produces better relaxation than gas and oxygen, but is more apt to cause acidosis, due to the ether.

5. *Ether*.—If prolonged it is certain to be followed by acidosis, as indicated by a fall in the carbon-dioxide combining power. It can be used, however, if this fact is borne in mind and the necessary post-operative measures taken to combat acidosis.

6. *Chloroform*.—Produces an extreme acidosis and is mentioned only to be condemned. It should never be used on a diabetic.

As a routine a blood-sugar and carbon-dioxide combining power test should be performed on all surgical diabetics prior to operation. If the CO_2 shows any appreciable drop below normal, operation should be deferred until the acidosis has been treated. This is an inviolable rule, even if the operation is designed to remove the cause acting to produce acidosis. A patient will survive the operation, but very often will not survive the acidosis following the operation. On the other hand, if the acidosis is treated first, he will survive them both. A routine blood-sugar and CO_2 test should be performed within five hours after operation, especially if anæsthetics in groups (3), (4), and (5) are used.

Insulin.—Granted that the patient has been well standardized before operation, his required dose is continued and increased as required when the blood-sugar tends to rise. For this reason it is necessary to have daily blood-sugar tests or even tests at twelve-hour intervals in the more severe diabetics.

Gas-bacillus Infection.—All cases for amputation receive a prophylactic dose of 25 c.c. *perfringens* antitoxin before operation. Fluids and carbohydrates are given just in the same way as in non-diabetic surgical cases.

Eliason has in the last two years encountered 14 cases of gas-bacillus infection in patients with diabetic gangrene. In 10 cases the complication was post-operative. In such cases wide excision or drainage or high amputation is indicated. When the stump has become infected, it is best to cut all sutures and lay the wound wide open and irrigate frequently with peroxide solution. *Perfringens* antitoxin should be given intravenously and intramuscularly in 25- to 50-c.c. doses.

[The reviewer's technique for a spinal anæsthetic is as follows : Spinocain is preferred. Ephedrine is given hypodermically half an hour beforehand. A fairly large bore needle is introduced into the spinal canal, slightly above the level of the crests of the ilium. Cerebrospinal fluid is withdrawn into the syringe so that the spinocain will be equally diluted before injection. The patient is put in a horizontal position on his face for about ten minutes. He is then turned on his back with the head low. If there is any continued

fall of blood-pressure or undue shock, intravenous glucose or blood transfusion is employed. Vasoconstrictors such as ephedrine are of no avail at this stage; the vasodilatation produced by the anaesthetic cannot be overcome. —W. I. de C. W.]

REFERENCE.—¹*Ann. of Surg.* 1933, July, 1.

GAS GANGRENE. (See also GANGRENE, DIABETIC.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

During and immediately after the War cases of gas gangrene were expected, and a diagnosis was seldom missed. In civil practice this infection is not very uncommon, but it is not uppermost in the minds of those practising medicine and surgery. It is seen most often in cases of compound fracture, but it may arise as a complication after an appendicectomy or other simple surgical procedure (see MEDICAL ANNUAL, 1933, p. 183, *Plate XII*). Cases are described in which gas-bacillus infection followed hypodermic injections. Crepitations in the presence of an infected wound are significant. **Gas Gangrene Antitoxins** combined with **Tetanus Antitoxins** are available, and should be employed more frequently as a prophylactic in cases of contaminated lacerated wounds in which the muscles are involved. Large quantities of **Alkalis** given by the mouth and **Glucose** intravenously not only prevent the acidosis which accompanies shock but also inhibit the development of a gas infection.

Early recognition is very important. Suspicion should be aroused if, after a few hours or even several days, progress after an injury is impeded by increasing temperature and pulse-rate. The wound is often more painful than the amount of trauma would explain. On examination the parts will be swollen and tender, with a discoloured area round the wound. There is a thin pinkish discharge. In the early cases crepitations may be absent. Smears and culture will often reveal the organism. X-rays may reveal the gas bubbles. In the treatment of such cases **Anti-gas-gangrene Serum** should be administered freely: 50 c.c. daily for three or four days is an average dose. The wound should be opened up and flooded with **Hydrogen Peroxide**. Obviously infected tissues should be excised. At the completion of operation hydrogen peroxide should be injected by syringe under the skin and into all the exposed tissues. High amputation is frequently required in advancing cases.

M. Wiseberg¹ deals with gas gangrene involving the extremities. He points out that gas gangrene is first of all and chiefly a disease of muscle which spreads in a longitudinal direction. It occurs in civil practice in wounds comparable to the wounds received in the War. He states that every crushed or lacerated wound, especially if contaminated with foreign bodies, is a potential source of gas gangrene. The warning signals are sudden high temperature, or the temperature mounting a degree or two every successive day, with rapid pulse, and, in younger persons, very rapid respirations. Pain is intense, corresponding to the rise in temperature. The toxic appearance of the patient, together with gangrene of the lacerated skin and a copper hue near the wound, are early manifestations. An unusual foul odour can be detected at a distance from the patient. The author recommends the injection of 90 to 100 c.c. of **Mixed Antitoxin and Antibacterial Sera** subcutaneously, intravenously, or intramuscularly. The injections are repeated every day. The serum may be given both intravenously and locally. If there is the slightest suspicion of impending gas gangrene, the serum (polyvalent gas-gangrene antitoxin) combined with tetanus antitoxin is administered; injections are usually given intramuscularly in the non-affected limb.

REFERENCE.—¹*Canad. Med. Assoc. Jour.* 1932, Sept., 278.

GASTRIC AND DUODENAL ULCER. *Robert Hutchison, M.D., F.R.C.P.*

ETIOLOGY AND PATHOLOGY.—W. C. Alvarez¹ is not satisfied with any of the theories of ulcer causation and particularly with the infection theory. He points out that this does not explain the peculiarities of the incidence of the disease. It is not likely, for instance, that focal infection is three times as common in men as in women, and it is well known that ulcers may recur in patients from whom all septic foci have been removed. He suggests that the importance of psychical factors has been overlooked and that ulcer commonly appears in persons who live under nervous tension. This may act by increasing the acidity of the gastric juice, by diminishing the production of protective mucus, by causing muscular or vascular spasm, or by interfering with biliary and pancreatic secretion. He considers these hypotheses in detail.

The vexed question of the *relation between peptic ulcer and cancer* is discussed very fully by W. D. Newcomb.² He suggests that the diversity of opinion on the subject arises from a lack of definite histological criteria for the diagnosis of ulcer-cancer. He has considered four such criteria and points out the great importance of fusion between the muscularis mucosæ and muscularis at the edge of the ulcer in diagnosis. Applying this test to a series of cases he found that 3.75 per cent of ulcers showed malignant change, whilst 13 per cent of cancers showed evidence of previous peptic ulceration.

J. W. Holmes and A. O. Hampton³ present evidence in favour of the view that 'chronic prepyloric ulceration' (i.e., chronic ulcers in an area extending for about one inch from the pyloric valve towards the antrum) are specially apt to be malignant, whilst benign ulcers commonly occur on the lesser curvature above the pyloric canal and rarely in the canal itself. If an organic lesion is demonstrated within the prepyloric area, the chances of its being malignant are about twelve to one.

J. Meyer, D. Fetter, and A. A. Strauss⁴ have tried to determine the relation of the *pain* of ulcer to gastric motility and acidity by administering 0.5 per cent HCl to ulcer patients and to controls. Their conclusion is that acidity is not the cause of pain in all cases of ulcer but that pain is due to acid-sensitivity when an associated gastritis is present. Pain may also be caused by 'hunger-contractions', which produce a depletion of the vascular bed in and about the ulcerous area. They consider the 'acid test' for ulcer to be unreliable.

TREATMENT.—D. M. Dunlop and R. M. Murray-Lyon⁵ have followed-up a large number of ulcer cases treated medically, the minimum time which had elapsed since treatment being a year and a half. Apparent cure had resulted in 48.7 per cent of the cases and improvement in 28.9 per cent. The age of the patient did not seem to influence the result, but the duration of symptoms before treatment had an important bearing upon it. They consider that the risk of alkalosis developing under 'intensive' treatment is slight.

A. M. Cooke⁶ deals more fully with the latter point from experience at St. Thomas's Hospital. Amongst 200 patients treated with the alkaline diet, 9 showed the characteristic changes of alkalosis. He summarizes these as follows:—

Typically the condition occurs in a man aged 35 to 55 years with an ulcerative lesion of the stomach at or near the pylorus, not necessarily with any clinical or X-ray evidence of pyloric obstruction, and not necessarily with any symptoms or signs pointing to impaired renal function. After about a week of intensive alkaline treatment he complains of headache, dizziness, backache, pain and tingling in the limbs, thirst, an unpleasant taste in the mouth, loss of appetite with a particular distaste for milk, abdominal pain, vomiting, drowsiness, and occasionally a craving for salt. Physical examination shows

that he has slight fever, rapid pulse, slow respiration, and that he looks ill with a shrunken, dehydrated, flushed face, furred tongue, and bloodshot eyes. The urine, strongly alkaline, contains protein and casts, and there is usually a diuresis. No abnormalities can be detected in the heart, lungs, or abdomen, but examination of the nervous and motor systems may reveal some heightened neuro-muscular irritability, more apparent on direct stimulation by tapping the muscles or by the galvanic current than by reflex stimulation. Sensory hyper-irritability is shown by the tenderness of the muscles on pressure, so much so that attempts to take the blood-pressure may be frustrated by the pain which is caused by the sphygmomanometer cuff. At the same time the patient displays mental changes of which the most striking feature again is hyper-irritability. A man usually of a complacent disposition becomes querulous and irritable, grumbling unreasonably about the most trifling annoyances, and may even have delusions of persecution. The blood-urea is greatly increased, whilst chlorides almost completely disappear from the urine. If treatment with alkalis is persisted in, the patient becomes more drowsy, tetany appears, and is followed by convulsions, coma, and death. If, however, treatment is stopped, the patient rapidly recovers but he will be intolerant of alkalis in the future. The administration of acids does not appear to hasten recovery, and, if large doses are used, may actually be dangerous.

W. Weitz⁷ strongly recommends emptying the stomach before the patient goes to sleep in cases of gastric and duodenal ulcer, especially where there is nocturnal pain. He uses a small-bore stomach-tube connected with a glass syringe. The method probably acts by removing irritating material and giving the ulcer rest all night.

REFERENCES.—¹*Amer. Jour. Surg.* 1932, Nov., 207; ²*Brit. Jour. Surg.* 1932, Oct., 279; ³*New Eng. Jour. Med.* 1933, May 1, 971; ⁴*Arch. of Internal Med.* 1932, Aug., 338; ⁵*Edin. Med. Jour.* 1932, Sept., 571; ⁶*Quart. Jour. Med.* 1932, Oct., 527; ⁷*Munch. med. Woch.* 1932, July 22, 1193.

GASTRIC AND DUODENAL ULCER, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

ETIOLOGY.—B. B. Crohn and J. Garendasy,¹ of New Jersey, describe a case of duodenal ulcer which in their opinion was definitely due to a blow on the abdomen. Melæna and hæmatemesis occurred within two days, and typical ulcer symptoms followed. Cases are rare in American literature, but numerous on the Continent of Europe. They are only to be allowed if there was a severe blow on the epigastrium, and if no symptoms were present before but followed immediately after and continued.

MEDICAL AND SURGICAL TREATMENT.—Two series of cases of peptic ulcer treated by medical and surgical means are compared by R. K. Felter and S. Weintraub,² of New York. The medical treatment was ambulatory with modified **Sippy Diet**, and **Alkalis** one hour after food. Nearly all the cases were followed up for over four years. The conclusions were as follows: (1) 104 cases of peptic ulcer were followed on an average for 5.6 years, 52 treated medically and 52 treated surgically. (2) Of the cases treated medically, 19 per cent were satisfactory. Of the surgically treated cases, 80 per cent were satisfactory. (3) Of the medically treated cases, 15 per cent more were improved. Of the surgically treated cases, 10 per cent more were improved. (4) The results were unsatisfactory in 66 per cent of the medically treated cases, and 10 per cent were unsatisfactory in the surgically treated group. It is pointed out that the surgical cases were those which had proved resistant to medical treatment. [The type of medical treatment adopted in these cases would not be considered efficient by a physician.—A. R. S.]

According to D. P. D. Wilkie,³ gastric and duodenal ulcer is becoming commoner, both in the medical and surgical wards. In Edinburgh there were 576 cases in 1910-12, and 1345 in 1930-2; the increase is specially in the patients with duodenal ulcer. It is a genuine increase, because perforated cases are now much more frequent than they were. In the female, however, the diagnosis of duodenal ulcer is often missed, the gall-bladder being unjustly blamed. Not uncommonly, the appendix, duodenum, and gall-bladder are all at fault (*Plate XXV*). Professor Wilkie proceeds with the following very sound and sane observations:—

“I regard an ulcer of the stomach or duodenum as essentially a condition requiring treatment on medical lines. Surgery may be called in to help when the reparative process has led to stenosis and mechanical difficulty, when, in spite of the maximum care which the patient can give, the ulcer breaks down repeatedly, when repeated hæmorrhages cause prolonged disability or endanger life, and when a chronic ulcer, failing to heal, threatens malignancy. Probably there would be little ground for controversy had gastric surgery been restricted to its primary field of relieving obstruction and of removing malignant or potentially malignant ulcers. It was the very success of the early cases of gastro-enterostomy for stenosis that led to the abuse of this most beneficent operation. Its employment as a short cut to cure in irritable ulcer, as a ‘hit at random’ in cases with no ulcer but with similar symptoms, as a ‘drainage operation’ in cases of visceroptosis and of atonic stomach, led to an accumulation of surgical derelicts, bitter complainers, the driftwood of an uncontrolled springtide of surgery. Even when confined to genuine ulcer cases the sequel of stomal or jejunal ulcer in a certain proportion of patients, variously estimated as from 2 to 30 per cent, turned the minds of surgeons to some alternative operation and the non-surgically minded to more intensive and prolonged medical treatment. On the Continent the balance inclined to more and yet more radical surgery—the removal of the whole ulcer-bearing area; in this country and in America, by associating the names of Sippy and MacLean with a somewhat stricter observance of an old-time medical régime, it swung to the conservative extreme.

“A considerable residue of stenosing and refractory ulcers which medicine has failed to cure has again brought the surgical treatment of ulcer to the fore.”

In cases of duodenal ulcer with constriction of the pylorus, **Gastro-jejunosotomy** has its greatest triumphs, but when there is no stenosis but an irritable recurrent type of ulcer, in a lean anxious patient, with marked hyperchlorhydria, there is real danger of a gastrojejunal ulcer following; and if after thorough trial of medical treatment an operation is necessary, **Gastroduodenostomy** is better (*Plate XXVI*—notice the mobilization of the duodenum on its outer side). Wilkie has performed this operation on 159 patients. The results do not equal those of gastrojejunosotomy. There were 64 per cent with excellent results, 25 per cent relieved, and 11 per cent still complaining. There were two ulcers of the stoma, both cured by gastrojejunosotomy. [We are inclined to think that even in these cases gastrojejunosotomy, followed of course by proper medical care, gives a higher percentage of excellent results, and that the gastrojejunal ulcers will not be above 5 per cent if great care is taken to leave no gaps in the suture of mucosa.—A. R. S.]

F. W. Bancroft and C. W. Lester,⁴ of New York, writing on the advantage of a combination of the internist, the radiographer, and the surgeon in the case of patients with gastroduodenal ulcer, relate a number of cases in which the team decided on **Appendicectomy** for pylorospasm, with or without duodenal ulcer. Usually there had been no clinical evidence of appendicitis, but the radiographer found tenderness over the appendix, or deformity of the

PLATE XXV

DUODENAL ULCER

D. P. D. WILKIE)

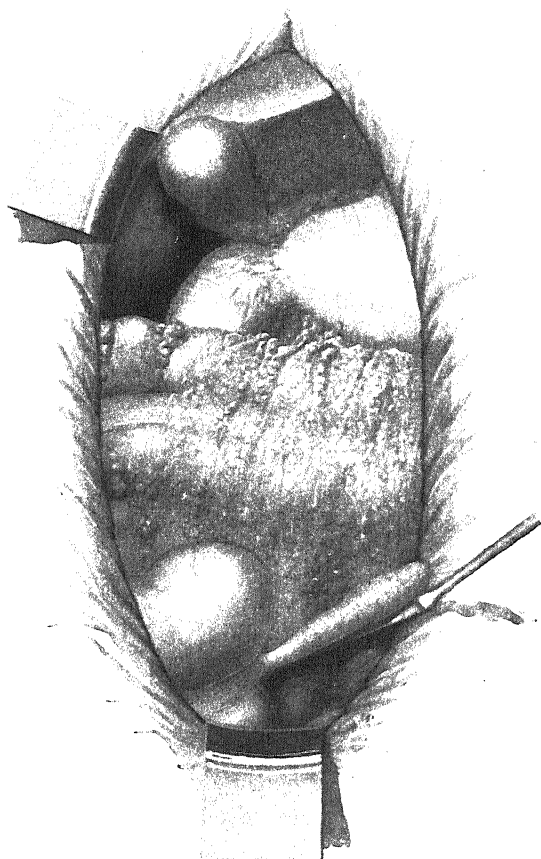


Fig. A.—The abdominal triad. Chronic cholecystitis with gall-stones, stenosing duodenal ulcer, and subacute appendicitis.

PLATE XXVI

DUODENAL ULCER—*continued*

D. P. D. WILKIE

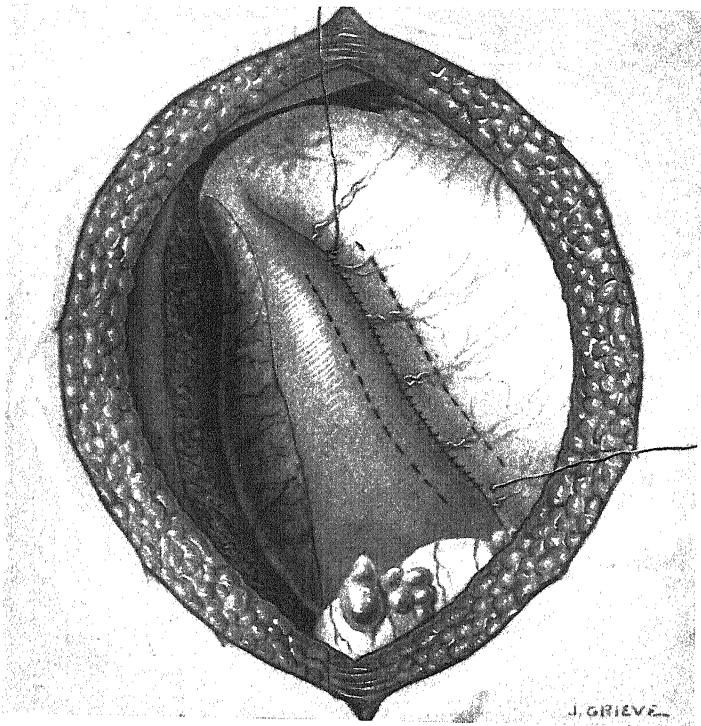
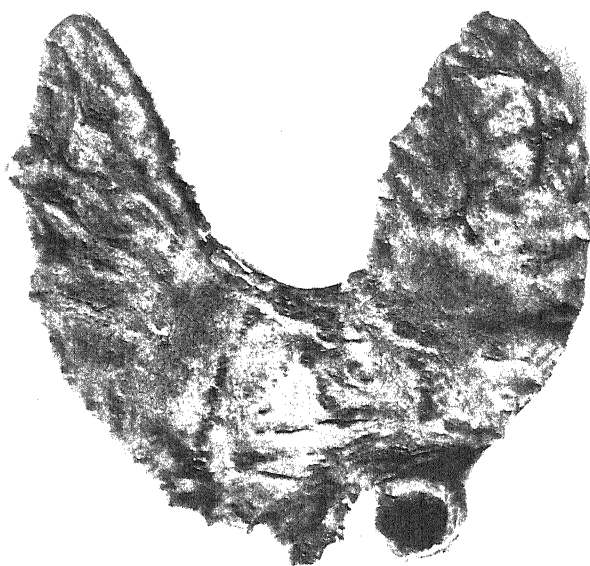


Fig. B.—Gastro-duodenostomy. Duodenum mobilized. First row of sutures inserted. Dotted lines indicate the position of openings in stomach and duodenum.

PLATE XXVII

ULCERATIVE GASTRITIS IN DUODENAL ULCER

(W. WALTERS)



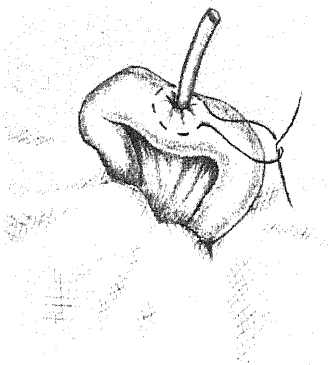
Ulcerative type of gastritis accompanying duodenal ulcer (Schmieden's clinic).

By kind permission of 'Annals of Surgery

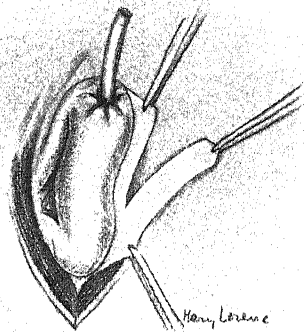
PLATE XXVIII—JEJUNOSTOMY

(W. H. BARBER)

J-24. STAMM-KADER

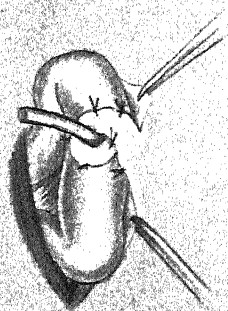


A.

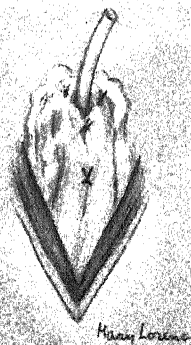


B.

J-24.



C.



D.

Jejunostomy with W. H. Barber's suggestion of muscle-peritoneal flap taken from edge of operative wound to provide suspension of jejunal loop and peritoneal coaptation. Tube is inverted.

cæcum, or a fixed appendix holding barium over 120 hours. Of the pylorospasm cases without ulcer, removal of the appendix gave 69 per cent good results and 31 per cent fair.

Operative Methods.—There is still considerable difference of opinion as to the best method of surgical treatment of the high gastric ulcer, ulcer of the lesser curvature or body, and duodenal ulcer. The *high gastric ulcer* may be almost impossible to resect without doing a total gastrectomy, an operation which is never worth while, except perhaps for cancer. C. A. Wells,⁵ of Liverpool, suggests a **Polya Gastrectomy** below the ulcer, leaving it behind. Four cases are described, all very successful. In Germany this is called Madlener's operation, and good results are claimed. H. Hartley,²⁰ of Burslem, has had good success with **Jejunostomy** (see p. 200). Nothing of importance has appeared during the year on methods of operation for *ulcers of the lesser curvature*, but the surgical treatment of *duodenal ulcer* continues to attract great attention in Germany and America. Professor Wilkie's preference for **Gastroduodenostomy** in certain cases has already been mentioned. F. G. Connell⁶ relates a case in which resection of a large wedge from the middle of the stomach (he calls it, strangely, '**Fundusectomy**'), with the idea of removing the acid-bearing area, cured a difficult patient.

H. Finsterer,⁸ writes again of his '**Resection for Exclusion**' method, already described and figured in the MEDICAL ANNUAL for 1932 (pp. 204). He says he has now used it for fourteen years. It is referred to in Continental literature as R.z.A. (Resektion zur Ausschaltung). The duodenal ulcer is left behind. In 95 cases 3 died; of 81 followed up for at least two years, 74 were quite well, 2 better, and 5 unrelieved. The method seems worthy of more attention than it has received in Great Britain, especially for large posterior duodenal ulcers. If such an ulcer is resected, it is very necessary to watch for the pancreatic and bile ducts, to ligature every vessel separately and not *en masse*, not to excise the fundus of the ulcer in the pancreas, but to drain its surface. To close the duodenum securely it must be separated well from the pancreas, at some distance from the fundus of the ulcer. In difficult cases R.z.A. is safer and gives just as good results. L. Zukschwerdt and T. Eck,⁹ of Heidelberg, have an extensive experience of the R.z.A. method for duodenal ulcer. Of 107 cases, 85 per cent were free from pain, in 3 the ulcer persisted, and in 11 there was pain without ulcer. In their hands gastro-jejunostomy cured only 50 per cent; this for some reason or other is the usual experience in Central Europe.

According to E. V. Redwitz,¹⁰ of Bonn, it is in the patients under forty that the failures occur; after that age the results are better. Resection gives 70 per cent very good, 20 per cent fair, and 10 per cent bad results.

A Roumanian surgeon, Professor I. Jacobovici,¹¹ describes a method of partial gastrectomy very similar to R.z.A. for ulcers of the pylorus and duodenum, which he calls '**Mucoclasia**': the anterior wall of the pylorus and duodenum is incised longitudinally and the mucous membrane destroyed with the electro-cautery. The seromuscular flaps are then sewn up. (Figs. 42, 43.)

Some light is thrown on the discrepancy between Central European and American (or British) end-results after gastrojejunostomy by observations quoted by W. Walters,¹² of the Mayo Clinic. Portions of stomach and duodenum resected in Germany for duodenal ulcer were compared with similar material from America, and there was found in the German cases a degree of associated ulcerative gastritis, of the pyloric antrum (*Plate XXVII*), which was absent in the American patients. This is a very important discovery, and shows that we must not be too influenced by Central European experience in our treatment of gastroduodenal ulcer.

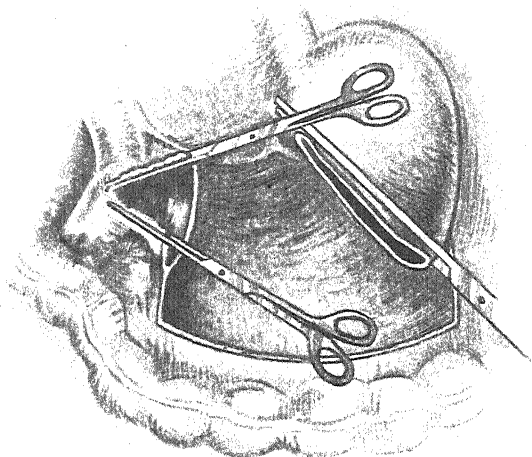


Fig. 42.

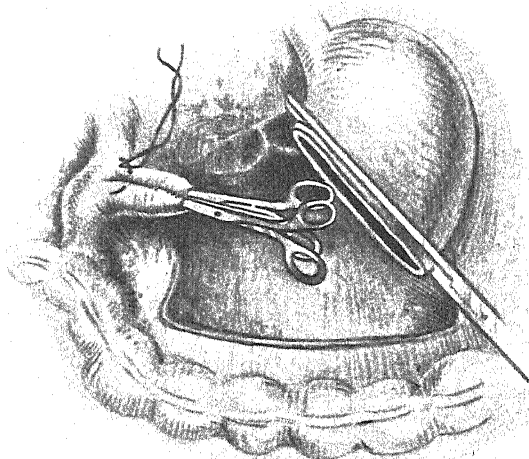


Fig. 43.

Figs. 42, 43.—Mucoclasia, showing the inversion of the flaps.

(Re-drawn from 'Zentralblatt für Chirurgie'.)

The situation with regard to the surgical treatment of duodenal ulcer to-day is confused. All the following methods have their advocates: (1) Simple gastro-jejunostomy; (2) Gastrojejunostomy with excision of an anterior ulcer; (3) Gastroduodenostomy (*see Wilkie, above*); (4) Resection of ulcer and pyloric ring (*see E. S. Judd, MEDICAL ANNUAL, 1933, 187*); (5) Partial duodenectomy; and (6) Finsterer's R.z.A., or 'mucoclasia'. In our opinion, no method has been proved to give better immediate and end results than the first and second of the above.

Hæmatemesis.—Donald C. Balfour,¹³ of Rochester, Minnesota, discusses the treatment of the *bleeding duodenal ulcer*. A difficult group of cases are those in which hæmorrhage occurs without previous symptoms of ulcer and in which exhaustive clinical and radiological examination afterwards fails to disclose a lesion. In such cases the bleeding generally comes from an inflammatory process in the duodenum. Other factors have to be considered, such as an obscure cirrhosis of the liver, splenomegaly, and lesions of the small intestine or appendix. But by far the commonest cause is duodenal ulceration. In fatal cases there is nearly always an eroded artery. In ordinary, the treatment should be medical, and a single hæmorrhage of moderate severity is not a sufficient ground on which to advise operation. One ought to open the abdomen and explore the duodenum as an emergency operation and with the aid of blood transfusion when the patient's life is in danger, or as an interval operation for recurrent hæmorrhage, whether there are clinical and roentgenological evidences of ulcer or not. In cases of recurrent bleeding without other symptoms, a duodenal ulcer of the posterior wall and rather further from the pylorus than usual will probably be found, but it may be so small that it can only be found when the duodenum is widely opened. No routine operation is satisfactory for all cases. A plain **Gastro-enterostomy** is good; in 85 per cent of the patients no further bleeding takes place. If possible, the ulcer should also be excised, or destroyed by the cautery, and feeding arteries tied. Another good operation is **Excision** of the ulcer and of the interior half of the pyloric sphincter; the protection against further hæmorrhage is at least 70 per cent. Balfour speaks well of Finsterer's R.z.A. for these cases. The most thorough treatment, however, is **Resection** of part of the duodenum with **Partial Gastrectomy**, finishing up, if possible, as a **Billroth I**. Unfortunately, this operation carries a much greater risk, and even so does not carry an absolute guarantee against recurrent bleeding. Within the month, Balfour had to operate on two physicians with recurrent bleeding jejunal ulcers following partial gastrectomy for bleeding duodenal ulcer. The best treatment under these difficult circumstances is to resect the jejunum, perform end-to-end jejuno-jejunostomy, re-resect the stomach to reduce the acid-bearing area, and re-implant the stomach into the second part of the duodenum.

A. W. Allen,¹⁴ reporting on 83 cases of sudden and massive hæmatemesis at the Massachusetts General Hospital in ten years (1922-31), says 17 died, 4 of them without transfusion or operation. The probability of spontaneous cessation of hæmorrhage diminishes with each subsequent attack. **Transfusion** is indicated in a severe hæmorrhage, as it aids in checking bleeding far more often than it starts bleeding again. If the latter happens, immediate operation is called for.

Hour-glass Stomach.—Several French surgeons give their experience. A. Gosset and G. Loewy¹⁵ prefer **Partial Gastrectomy** when the ulcer is small and not adherent, and the patient in good condition. If the conditions are otherwise, a **Gastro-gastrostomy** is simple and effectual, unless there is a big ulcer-crater; in that case, in spite of the risk, a partial gastrectomy is necessary. They give their results as follows:—

FORTY-TWO OPERATIONS FOR HOUR-GLASS STOMACH AT THE SALPÊTRIÈRE.

OPERATION	NO.	OPERATIVE MORTALITY	LOST SIGHT OF	DIED LATER	RESULT KNOWN	CURE	FAILURES
Gastrojejunostomy	13	1	1	1 Heart failure	10	9	3 ulcers 1 cancer
Gastrogastrostomy	21	1	—	1 T.b. peritonitis	19	15	4
Gastroplasty	.. 6	—	—	—	6	5	1
Resection	.. 2	—	—	—	2	2	—
Total	.. 42	2	1	2	37	31	9

P. Brocq and S. Ortega¹⁶ relate 17 cases very variously treated. Two died. Gastro-enterostomy of the upper pouch was a failure; 4 gastro-gastrostomies did well; annular gastrectomy (sleeve resection) was quite successful in 3 cases; 4 partial gastrectomy cases were all cured.

Gastrojejunal Ulcer.—P. Valdoni¹⁷ discusses 52 cases seen in the surgical clinic in Rome. About 6 per cent of their gastrojejunostomies were followed by this complication. In 50 cases the primary operation was for duodenal ulcer, and in only 2 for gastric ulcer; in 3 cases a partial gastrectomy had been done. For the treatment of the condition quite a variety of different procedures have been tried with variable success. According to E. B. Benedict,¹⁸ hæmorrhage is common but seldom serious; perforation into the general peritoneal cavity is rare, but into the colon occurs in 10 to 15 per cent of the cases. The best treatment is to undo the gastro-enterostomy, with **Pyloroplasty** or **Gastroduodenostomy** if the pylorus is obstructed. If these fail, there remains the possibility of a **Subtotal Gastrectomy**. W. B. Ebeling,¹⁹ of Philadelphia, contributes a paper on primary jejunal ulcer, which is rare, produces symptoms like those of peptic ulcer, is apt to perforate, and carries a relatively high mortality. The treatment is **Resection**.

Jejunostomy.—Two British surgeons, H. Hartley,²⁰ of Burslem, and S. Hillman,²¹ of Portsmouth, are much impressed with the value of jejunostomy in very sick patients with a large gastric ulcer. They relate 4 and 2 cases respectively, all successful. The patient could be fed entirely by the tube; pain ceased at once, the weight increased, and the ulcer got much smaller or healed. In two of Hartley's cases no further operation was necessary; indeed, he uses jejunostomy as the routine operation in every case of gastric ulcer where medical treatment has failed.

W. H. Barber,²² of New York, believes that there are a good many unnecessary deaths from peritonitis and intestinal obstruction within a few days of a jejunostomy whether for ulcers of the stomach or for paralytic ileus. With the usual Witzel technique the involved jejunum becomes very inflamed or necrotic. Better results can be obtained with the Stamm-Kader (red-ink bottle or lobster-pot) technique, and instead of omentum, he sews around the tube a flanged flap of peritoneum-muscle (*Plate XXVIII*). This seals the suture-line, suspends the loop, and favours spontaneous closure. But when the jejunostomy is likely to be wanted for many weeks, he says it is better to get rid of the tube altogether, bring out a loop of jejunum and open it as in the Mikulicz operation, but with a jejuno-jejunostomy added to maintain the

continuity of the bowel. [This seems too drastic.—A. R. S.] Symptoms like those of intestinal obstruction are relieved by giving gastroduodenal secretions with the jejunal feeds.

Perforation.—

DIAGNOSIS.—Surely S. Judine,²³ of Moscow, must have the largest personal experience in the world of perforated gastric and duodenal ulcers. He has treated 556 cases, his average being about one hundred a year. Strange to say, amongst the last 404 cases there were only 4 females. Duodenal ulcers perforated far more frequently than gastric; the gastric cases were nearly all over forty years of age. In 20 per cent of the patients, there was no complaint of any previous symptoms. There is usually no great difficulty about the diagnosis. When there is any doubt a plain X-ray will nearly always settle the matter, but it needs to be correctly used. If the patient has a large thorax and a wide subcostal angle, gas will be found between the dome of the liver and the diaphragm. If the thorax is narrow and the liver longer than it is wide, the escaped gas cannot turn the border of the liver and get up under the diaphragm. To visualize it in such cases the patient must be lying down, turned on his left side, and examined in profile.

TREATMENT.—Judine sees four or five proved cases every year who refuse operation and yet get well. As readers of the MEDICAL ANNUAL in previous years will remember, he is the most strenuous advocate of **Partial Gastrectomy** for perforated ulcer. In his last 212 patients, he has reduced the mortality to 12 per cent; of these there were 168 gastrectomies, of whom only 6 per cent died. He concludes "Messieurs, j'ai terminé ce plaidoyer pour la défense d'une méthode qui m'est chère".

E. Kreuter,²⁴ of Nürnberg, describes a series of 150 cases, of which 80 were treated by **Resection** and 70 by **Palliative Operations**. Amongst the former the death-rate was 21.4 per cent, amongst the latter 34.9, so that for the whole series there was a mortality of 27.8 per cent.

J. Gilmour and J. H. Saint²⁵ review 64 personal cases from Newcastle-on-Tyne. There are 58 duodenal, 4 pyloric, and 2 gastric ulcers; 58 men and 6 women. (In 1929 there were 221 perforated ulcers treated at the Royal Victoria Infirmary in Newcastle.) All the patients except one were treated by **Simple Suture**. Only 3 cases died (4.7 per cent). The authors were fortunate in that 51 of their patients reached them under twelve hours. Of 48 followed up, 28 (63.6 per cent) had a good or fairly good end-result, and 16 (36.4 per cent) continued to suffer from well-marked ulcer symptoms. Ten of these had a subsequent gastrojejunostomy. A. Corverse,²⁶ of Rhode Island, presents a series of 106 cases treated mostly by simple suture with a mortality of 29 per cent.

MM. Hartglas and Grenfeld,²⁷ of Meaux, contribute an article on what they call *covered perforation*. The initial symptoms may be stormy or may be quiet, but they soon pass off. Four cases are related, which all recovered after operation and would probably have done so without.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1933, May, 1653; ²*Ann. of Surg.* 1933, June, 875; ³*Brit. Med. Jour.* 1933, i, 771; ⁴*Ann. of Surg.* 1932, Dec., 1036; ⁵*Brit. Med. Jour.* 1933, i, 778; ⁶*Ann. of Surg.* 1932, Aug., 200; ⁷*Wien. klin. Woch.* 1933, May, 545; ⁸*Bull. et Mém. Soc. nat. de Chir.* 1933, March, 373; ⁹*Deut. Zeits. f. Chir.* 1932, Oct., 457; ¹⁰*Ibid.* 1933, April, 1; ¹¹*Zentralb. f. Chir.* 1932, Oct. 2., 2606; ¹²*Ann. of Surg.* 1932, Aug., 258; ¹³*Ibid.*, Oct., 581; ¹⁴*New Eng. Jour. Med.* 1933, Feb., 237; ¹⁵*Presse méd.* 1933, Feb., 209; ¹⁶*Bull. et Mém. Soc. nat. de Chir.* 1932, Dec., 1568; ¹⁷*Policlinico.* 1932, July, 444; ¹⁸*Surg. Gynecol. and Obst.* 1933, April, 807; ¹⁹*Ann. of Surg.* 1933, June, 857; ²⁰*Lancet*, 1933, i, 1122; ²¹*Brit. Med. Jour.* 1933, Feb., 221; ²²*Ann. of Surg.* 1933, April, 553; ²³*Bull. et Mém. Soc. nat. de Chir.* 1933, May, 775; ²⁴*Zentralb. f. Chir.* 1932, Aug., 2017; ²⁵*Brit. Jour. Surg.* 1932, July, 78; ²⁶*New Eng. Jour. Med.* 1932, Sept., 390; ²⁷*Presse méd.* 1933, March, 500.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Repeated Perforations in a Case of Duodenal Ulcer.—There is little mention in the literature of cases of repeated perforation of the same duodenal ulcer. The following case is unique in the reviewer's experience, and is perhaps worthy of brief record.¹ A man, aged 65, was admitted into the Southend General Hospital on June 9, 1933. A few hours previously he was seized with the sudden excruciating pain so characteristic of perforation, and when admitted he had all the familiar signs and symptoms of this catastrophe. He diagnosed his own condition and was able to give a concise account of three similar experiences. In May, 1925, he was admitted to St. Olave's Hospital, Rotherhithe, as an acute abdominal emergency; the abdomen was opened, and a perforated 'gastric' ulcer was embedded and closed by suture. In 1927 he was operated upon on admission to St. Leonard's Hospital, Hoxton Street, for a second perforation, and again in the same hospital in August, 1932. Although full notes were not available, the same type of emergency operation was performed—suture and infolding—on each occasion.

The fourth perforation, as already mentioned, occurred on June 9, 1933, and the abdomen was opened through the old scar. Adhesions were conspicuous by their absence; the general peritoneal cavity contained gas and much free fluid. The perforation was readily found in the first portion of the duodenum adjacent to the pylorus. It was closed in the usual manner, covered with omental tags, and on this occasion a posterior gastro-enterostomy was performed. The patient made a rapid recovery, and was discharged from hospital a month later. A careful search was made for any evidence of gastric ulcer, but none was found. We felt certain at the end of the operation that it was the same duodenal ulcer which had perforated and had given rise to the same typical clinical phenomena on each of the four separate occasions.

Moynihán² mentions cases of recurrence of perforations of gastric ulcers. In one case the same gastric ulcer perforated twice; in a second case perforation occurred in a fresh ulcer 4½ in. from the former one.

REFERENCES.—¹*Brit. Med. Jour.* 1933, ii, 646; ²*Abdominal Operations*, i, 232.

GASTRITIS.

Robert Hutchison, M.D., F.R.C.P.

There has recently been a revival of interest in gastritis, especially on the Continent. The microscopic examination of portions of stomach removed at operation, the use of the gastroscope, and the radiological examination of the gastric mucous membrane by a special technique,¹ have all added to our knowledge. It is now known that gastritis is not a mere catarrh of the mucous membrane but that it involves all layers of the stomach wall and sometimes even the peritoneal coat. The histological changes are described in detail by G. E. Konjetzny² but need not be enumerated here.

ETIOLOGY.—As regards etiology, two forms are recognized: a primary, or exogenous, and a secondary, or endogenous. The former is due to irritation of the stomach by irritating material which has been swallowed; the endogenous form to the excretion of toxic substances in such diseases as nephritis, specific fevers, and phthisis. This, of course, has long been well known. Seeing, however, that all stomachs are exposed to frequent 'insults' and that yet everyone does not get gastritis, the operation of a constitutional factor as predisposing to the development of the disease has been suggested by G. Sinnesberger.³

SYMPTOMATOLOGY.—Recent work has added nothing new to our knowledge of the ordinary symptomatology of the condition except to show that localized areas of gastro-duodenitis may produce symptoms almost identical with those of peptic ulcer, including hæmatemesis, which may be profuse and recurrent

(see H.EMATEMESIS). The chronic form of gastritis may be symptomless or may simulate a mild functional dyspepsia. It can be recognized by the presence of mucus intimately mixed with the vomited material or, if there is no vomiting, by mucus in the stomach washings. Achlorhydria is the rule, but in severe cases the ferment-producing cells suffer also and achylia may result (Gottfried Holler⁴).

TREATMENT.—There is nothing new to be reported about medical treatment; the question of excising localized areas of inflammation which simulate ulcer and cause bleeding is, however, being discussed.

REFERENCES.—¹See Monauni, *Wien. klin. Woch.* 1933, April 14, 459; ²*Ibid.* 451; ³*Ibid.* 458; ⁴*Ibid.* April 7, 420.

GERMAN MEASLES. (See RUBELLA.)

GOITRE. (See THYROID.)

GONORRHEA. (See also TESTIS, ETC., SURGERY OF—GONOCOCCAL EPIDIDYMO-ORCHITIS.)
Col. L. W. Harrison, D.S.O.

DIAGNOSIS.—

Neuer's Gonococcal Skin Reaction.—F. Ornstein¹ has investigated the skin test introduced by J. Neuer (see MEDICAL ANNUAL, 1933, p. 194) to ascertain its concordance or otherwise with the complement-fixation test. The skin of the upper arm was scarified in three places; **Blennotest*** was rubbed into two of the places and sterile broth into the third. In 99 out of 113 cases the result of the skin test agreed with the complement-fixation (60 negative and 39 positive). In the remaining 14 were 8 with positive C.F.T. but negative skin (5 of these were cases which were apparently cured and had been treated with vaccine), and 6 with positive skin but negative C.F.T. The author thinks that the results show the skin test to be a valuable one in disclosing the presence of deep gonococcal foci.

Complement-Fixation Test.—E. Retzlaff² has found that **Compligon**,† a filtrate of gonococcal culture prepared for vaccine treatment purposes by Schering-Kahlbaum, is a useful antigen in the complement-fixation test. She uses in the test proper 0.5 c.c. of 1-5 patient's heated serum, 0.25 c.c. of 1-10 guinea-pig serum, and 0.25 c.c. of 1-6 compligon, which are incubated for thirty minutes in the water-bath before 0.5 c.c. of sensitized cells is added. The reading is taken as soon as the serum and antigen controls show complete hæmolysis.

TREATMENT.—Since the last review of this subject the literature on the treatment of gonorrhœa appears to have been comparatively scanty, and beyond the papers by P. A. Clements and J. Oliver³ nothing has appeared which can be described as an improvement on existing methods. The work of Clements and Oliver was briefly mentioned in the MEDICAL ANNUAL, 1933, p. 195. In the course of an investigation of a special **Vaccine** which the authors term '**Ecto-antigen**' it became clear that two principles are vital to the cure of a case of gonorrhœa—namely, adequate drainage and a high resistance as gauged by the complement-fixation test. In the paper referred to above the authors present evidence of these truths. Clements showed that the response to a given dose of vaccine varies greatly with different patients. Thus 0.1 c.c. of the ecto-antigen would produce a severe rigor in one patient while another might not react to as much as 1.5 c.c. Again, in some patients

*Serotherapeutie Institute, Vienna.

†Schering, 188-192, High Holborn, W.C.1.

the response as gauged by the complement-fixation test was prompt, and usually then the clinical progress was good, while in others it was poor. The inference is that vaccine therapy of gonorrhœa without the application of the complement-fixation test to gauge its effect may prove very disappointing. Oliver's sketch of the method of preparing the 'ecto-antigen' touched shortly on the effect of the medium on which the organisms are grown in precipitating the toxins so that they do not appear in the finished product. This toxin, which results from autolysis of gonococci, appears from the previous work of Dimond, Lambkin, and colleagues, as well as from that of Clements and Oliver, to lower the patient's resistance, and it may be that many failures with ordinary gonococcal antigen are due to this cause.

A review of present practice in Germany in the treatment of gonorrhœa by C. Speierer⁴ may be interesting for comparison with that extant in this country. On the complement-fixation test and vaccine therapy he is tepid, though acknowledging that they may help. Amongst newer methods he mentions radiography of the urethra after filling this with an opaque medium. In treatment he refers to filling of the urethra with formalin vapour according to the recommendations of Monis, distension with foam (Bizard-Maizler), drying the urethra with powder (Perl-Nowawes), injection of adrenalin 1-10,000 (Gjorgjevic), and injection of ether and olive oil (Urdapilleta). Speierer says that these methods, as also diathermy of the urethra, have found few adherents. Discussing the local treatment of gonorrhœa in males, he emphasizes the importance of using nothing which will damage the epithelium, and in anterior urethritis favours **Protargol**, 1 in 800 to 100; **Albargin**, 1 in 1000 to 500; **Necaron**, 1 in 4000 to 1000; **Choleval**, 1 in 400 to 100. He recommends ringing the changes on these, and finds no advantage in the newer silver preparations. As a general working principle he suggests that the concentration of the solutions should be inversely proportional to the acuteness of the symptoms. In cases of posterior urethritis he recommends Janet's irrigation. Later posterior urethroscopy with the Glingar irrigating instrument is often valuable in localizing foci, which are dealt with by galvano-cauterization, by coagulation, and by high frequency. In epididymitis **Diathermy** gives good results. For arthritis intravenous injection of **Electro-collargol** or of **Argo-chrom** are suggested, and in selected cases of chronic gonorrhœa **Malaria** may be useful; malaria has, however, given better results in gonorrhœa of women.

With regard to the possibilities of **Fever Therapy** of gonococcal infections C. M. Carpenter, R. A. Boak, L. A. Mucci, and S. L. Warren⁵ recently made an elaborate investigation to determine the length of time which gonococci would survive temperatures of 40° C., 41° C., 41.5° C., and 42° C. respectively. They showed that gonococci varied within rather wide limits in their resistance to heat. Thus in 15 strains subjected to a temperature of 41.5° C. there were 2 which were not completely destroyed in nearly twenty hours, while some others did not survive longer than seven hours. By plating methods, however, the authors showed that a temperature of 41.5° C. destroyed 99.9 per cent of the gonococci in two hours, while to achieve the same result with a temperature of 41° C. required four hour's exposure. Turning to the application of these findings to treatment, the authors mention that a temperature of 41.5° C. induced either by high frequency or by short-wave radiation can be sustained by the average patient for five hours, so that artificially induced fever is a practicable method of treating gonococcal infections.

D. Stein⁶ suggests the use of **Cod-liver Oil Concentrate** in chronic gonorrhœa. He was led to its trial by reports on the metaplasia of epithelium and keratinization resulting from vitamin A deficiency. Referring to experiments

by, *inter alios*, Green and Mellanby,⁷ he quotes that in which 44 per cent of 92 rats fed on diets deficient in vitamin A showed infection of the genito-urinary tract, including prostate, seminal vesicles, and ovaries, while none of a control group of 50 rats on the same diet with the addition of cod-liver oil developed any sign of such an infection. The authors suggested that the susceptibility to infection might be due to the favourable medium for bacterial growth provided by obstruction with desquamated epithelium. The constant appearance of cornified epithelial cells in the vagina of the rat has been used by several workers as a criterion of vitamin A deficiency. Stein reports briefly, as examples of the value of administering vitamin A, five cases of persistent gonorrhœa in which the administration of three tablets of cod-liver oil concentrate three times a day appears to have had beneficial results.

Gonorrhœa in Women.—F. Falkenstein⁸ recommends for cervical gonorrhœa the daily instillation of **Flavadin*** (an arsenical and acridine dye compound) into the cervical canal. The first dose is 1 to 1.5 c.c. of the preparation sold ready for use by I.-G. Farbenindustrie, Leverkusen, and is increased by 0.5 to 1 c.c. daily until 2.5 to 3 c.c. are being injected. The instillation is preceded by thorough cleansing of the canal by swabbing. The author claims that gonococci disappear in five to eight sittings, and that the treatment is attended by a very low incidence of complications.

Vulvo-vaginitis of Little Girls.—In a valuable report on vulvo-vaginitis of children⁹ W. M. Brunet and D. M. Tolle, who contributed the clinical section, found that of 241 cases 192 (79 per cent) were found to be due to gonorrhœa and 14 per cent were regarded as suspicious. Investigation of the sources of infection by A. R. Medcalf, who contributed the social section, in 113 cases disclosed gonorrhœa in one or other members of the family in 104, showing the great importance of home infection. In 80 per cent of the children examined by Brunet and Tolle the cervix was infected, and 4 per cent had pelvic complications. Local treatment, as judged by controls, did not appear greatly to shorten the duration of the disease, which the authors think is self-limited. Application of 2 per cent **Mercurochrome** appeared to give the best results. It was applied through an endoscope tube by syringing, with a bulb type of syringe, the solution against the cervix. This was done at home after the parents had been instructed in the technique. [A strength of about 2 per cent is sometimes stated to be the maximum when using mercurochrome. I think it can be increased to 10 or even 20 per cent with advantage—L. W. H.] In 84 cases in which no vaginal treatment was given the duration was rather longer than in those which were treated with mercurochrome.

A. C. Ruys and P. A. Jens¹⁰ refer to the differing views by authors on the frequency of *proctitis* in gonococcal vulvo-vaginitis of children, and attribute them to the infrequency of symptoms and the technique of taking specimens. Investigating 17 cases by slide and culture, they found the rectum infected in every one. As illustrating the value of cultures in diagnosis, in 73 tests of rectal secretion they found culture and smear both positive 35 times; both negative, 16; culture positive but smear doubtful, 8; culture positive but smear negative, 8; culture negative, smear positive, 3; and culture negative, smear doubtful, 3.

In another paper, Ruys¹¹ gives the results of examination of 149 specimens of vaginal secretion from 28 cases of gonococcal vaginitis. She found in these both culture and smear positive 67 times; both negative, 67; only the

*Bayer Products Ltd., Africa House, Kingsway, London, W.C.2.

culture positive, 8; and only the smear positive, 7. In this paper the author reports that routine cultural tests of secretion from children with vaginitis showed the majority to be non-gonococcal. In these the organisms found included *M. catarrhalis*, meningococci, influenza bacilli, and hæmolytic streptococci.

REFERENCES.—¹*Wien. klin. Woch.* 1932, Dec., 1536; ²*Klin. Woch.* 1932, xi, 2078; ³*Brit. Jour. Ven. Dis.* 1933, July, 147; ⁴*Münch. med. Woch.* 1932, Aug. 12, 1322; ⁵*Jour. Lab. and Clin. Med.* 1933, xviii, 981; ⁶*Med. Jour. and Record*, 1933, June 21, 504; ⁷*Brit. Med. Jour.* 1928, ii, 691; ⁸*Dermatol. Woch.* 1929, xcv, 1785; ⁹*Hospital Social Service*, 1933, March, Sup. No. 1; ¹⁰*Münch. med. Woch.* 1933, lxxx, 846; ¹¹*Centralb. f. Bakteriöl.* 1933, Jan. 30, 280.

GRANULOMA INGUINALE. (See BUBO, CLIMATIC; LYMPHOGRANULOMA INGUINALE.)

GRANULOMA PYOGENICUM. (See SKIN, PYOGENIC INFECTIONS OF.)

GUINEA-WORM DISEASE. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

The guinea-worm, *Dracunculus medinensis*, causes a great deal of disability in extensive areas of Southern India, where V. N. Moorthy,^{1,2} has studied both the epidemiology and prophylaxis. In some villages of Mysore as many as 20 per cent of the people may be incapacitated by presence of the adult worms in their subcutaneous tissues some nine months after swallowing the larvæ in cyclops or water-fleas derived from drinking well-water. Under experimental conditions the infected cyclops survived in the well water up to sixty-two days, but 0.2 to 0.4 per cent hydrochloric acid kills the cyclops, but the larvæ within them are stimulated and some of them may escape from the cyclops and the larvæ may survive for up to seven days in well-water, but only for about twenty-eight hours in distilled water. Clinically the adult worms come to the surface in some part of the lower extremity in about 80 per cent of the patients, with the formation of a blister, and eosinophilia, and such toxic symptoms as urticaria, sickness, and cyanosis, apparently of an anaphylactic nature, which the writer found to be relieved by 5 to 7 min. of **Adrenalin** solution subcutaneously. The young embryos are now discharged, and some reach the well-water to develop in the cyclops and complete the cycle.

As treatment is unsatisfactory and only palliative, prophylaxis is most important, for 83 per cent of infections are recurrences, sometimes yearly, in previously infected patients. Analysis of the water of infected wells showed that both the cyclops and the larvæ survive for a shorter time in brackish water. The writer also found that small fish of the genus *Barbus* feed voraciously on the cyclops, and he is hopeful that they may prove of value in reducing the incidence of the disease when added to water-supplies. Among chemical additions to water with a view to killing or reducing the cyclops and larvæ he found the best to be copper sulphate, 1 lb. per 200,000 gallons, followed by percloron, 3 lb. per 100,000 gallons, three days later, and repeated after another three days, but this course must be repeated every month or two during the infective season from March to June. The addition of young bamboo shoots to drinking water is also said to be of value, but this requires further investigation, though preliminary experiments show some injurious effect on cyclops. The old Indian plan of straining infected waters through cloth to remove the cyclops should not be neglected. A more expensive, but lasting, method is to replace the dangerous stepwells, so easily infected by embryos escaping from the people's feet and legs, by tube wells or covered ones fitted with pumps.

REFERENCES.—¹*Ind. Med. Gaz.* 1932, Sept., 498; ²*Ibid.* Nov., 612.

HÆMATEMESIS.*Robert Hutchison, M.D., F.R.C.P.*

ETIOLOGY.—A. B. Rivers and D. L. Wilbur,¹ from a study of a large series of patients admitted for hæmatemesis to the Mayo Clinic, conclude that in 90 per cent there is an intrinsic lesion of the stomach or duodenum. Peptic ulcer is by far the commonest cause, whilst cancer only accounted for 12 per cent. Severe hæmatemesis does not occur in more than 1 per cent of cancer cases. Areas of inflammation, diffuse or localized, are a common cause of indeterminate hæmorrhage, and may lead to symptoms suggesting ulcer clinically, but they show nothing on X-ray examination.

E. L. Bortz² has made a fuller study of diffuse hæmorrhage from inflammatory and eroded areas, cases sometimes described as gastrostaxis, and gives the following points as diagnostic of it. It occurs in young adults, and is four times commoner in women than in men; there may be no previous history of indigestion; the hæmorrhage is often recurrent at intervals of some months; the symptoms are less severe than those in cases of true ulcer; the X-ray examination is negative; often, after the bleeding, all pain and discomfort disappear.

Maurice E. Shaw³ considers that peptic ulcer—especially of the acute type—cirrhosis, and splenomegaly account for the great majority of cases of hæmatemesis in which a definite diagnosis is made. He agrees as to the rarity of carcinoma as a cause, but of 17 patients admitted to the West London Hospital with hæmatemesis in 1932, the cause was undetermined in as many as 10 (60 per cent), whilst chronic gastric or duodenal ulcer was present in 4 (30 per cent). He suggests, therefore, that when one is called to a case of hæmatemesis the possibility of chronic ulcer should not bulk too largely in one's mind in the differential diagnosis.

PROGNOSIS.—Great differences of opinion continue to be expressed as to the danger of hæmatemesis when it occurs as the 'presenting symptom'. E. Bulmer⁴ has brought up to date the experience of the General Hospital, Birmingham, which was referred to in the MEDICAL ANNUAL for 1929 (p. 210). The results in a smaller series of cases admitted since 1926 are not appreciably different from the previous series, and the author's conclusion is that in Birmingham over a period of thirty years the experience of one hospital suggests a mortality in hæmatemesis from peptic ulcer (acute and chronic) of about 10 per cent—the death-rate among men being at least double that among women, and occurring at rather a later age-period. Ulcer (acute or chronic) was the cause of the hæmorrhage in 578 out of 649 cases admitted.

W. E. Chiesman⁵ found that of 137 males admitted to St. Thomas's Hospital for hæmorrhage from peptic ulcer, 27 per cent died, and of 54 females, 15.6 per cent—a totality mortality of 25 per cent. All these were treated medically. In recurrent or continued hæmorrhage 74 per cent of cases were fatal. On the other hand, Maurice Shaw, in the paper referred to above, finds the mortality at the West London Hospital—though in a much smaller number of cases—to be not more than 3 per cent for cases of hæmatemesis from ulcer, both acute and chronic. It is difficult to explain these prognostic discrepancies.

TREATMENT.—Medical treatment by **Rest, Morphia**, etc., is still the routine in the great majority of cases. Shaw favours **Lavage with Iced Water**, 4 oz. being run in at a time through a large stomach tube passed as far as the cardiac orifice. Chiesman, in view of the experience at St. Thomas's, is not altogether satisfied with medical treatment alone and puts in a plea for the consideration of operation in the continued and recurrent cases.

REFERENCES.—¹*Arch. of Internal Med.* 1932, Oct., 621; ²*Ibid.* July, 1; ³*Lancet*, 1933, ii, 335; ⁴*Ibid.* 1932, ii, 720; ⁵*Ibid.* 722.

HÆMATURIA. (*See also* BLADDER, SURGERY OF; KIDNEY, SURGERY OF.)
Hamilton Bailey, F.R.C.S.

R. K. Debenham,¹ in a study of 742 consecutive cases of hæmaturia occurring in the Genito-urinary Department of the London Hospital, has arranged a list of the causes in relation to the decades of life.

1ST DECADE (AGE 1-10).—Calculi and pyelitis are almost the only causes of bleeding.

2ND DECADE (AGE 11-20).—

Boys.—Pyelitis and cystitis are the commonest forms of hæmaturia at this age. Tuberculosis and calculi come next.

Girls.—Hæmaturia is rare at this age. Stone, tuberculosis, pyelitis, and foreign bodies in the bladder account for the few examples that exist.

3RD DECADE (AGE 21-30).—

Men.—Pyelitis, cystitis, tuberculosis, and stone are the commonest causes, in this order.

Women.—Pyelitis and cystitis are much the commonest causes. Tuberculosis and stone come a poor second.

4TH DECADE (AGE 31-40).—

Men.—Cystitis and pyelitis are still the commonest causes, followed by stone, papilloma of the bladder, and tuberculosis respectively.

Women.—Pyelitis and cystitis remain the captains of the causative agents.

5TH DECADE (AGE 41-50).—

Men.—For the first time neoplasm heads the list. Stone and inflammatory conditions, which are about equally frequent, come next, while tuberculosis is rare.

Women.—Pyelitis and cystitis are still the commonest etiological factors.

6TH DECADE (AGE 51-60).—

Men.—Neoplasm, especially carcinoma of the bladder, is the commonest cause. This is followed by enlarged prostate, while inflammatory conditions now become third.

Women.—For the first time neoplasm becomes the premier factor. Cystitis and pyelitis now take the second place.

7TH AND 8TH DECADES (AGE 61-80).—

Men.—Enlarged prostate and carcinoma of the bladder are by far the commonest at this period.

Women.—Papilloma and carcinoma of the bladder are usual causes of hæmaturia at this age.

REFERENCE.—¹*Brit. Jour. Surg.* 1933, July, 44.

HÆMOPHILIA.

Stanley Davidson, M.D., F.R.C.P.E.

C. L. Birch¹ claims, from a study of 35 persons suffering from hæmophilia, that treatment with **Ovarian Preparations** is the best way of reducing the coagulation time. The whole gland in amounts of from 60 to 120 gr. daily is said to be the most satisfactory method of administration, but injections of **Theelin** were also of benefit.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1932, Nov. 5, 1566.

HAIR DYES. (*See* COSMETICS.)

HALITOSIS.

Robert Hutchison, M.D., F.R.C.P.

Not much attention, as Joseph I. Kemler¹ points out, has been devoted in medical literature to the subject of halitosis, meaning by that a condition in which a person habitually has a 'bad breath' although otherwise apparently in good health. Apart from causes in the nose, teeth, gums, and tonsils,

halitosis, according to Kemler, is not infrequently due to furring of the tongue with decomposition of the fur, the condition being sometimes confined to the back of the organ. Scrapings of the fur give off the same odour as is present in the breath.

The treatment must be mechanical. The tongue should be cleaned twice a day with a special brush with an angular handle, using a solution of **Vanillin** (vanillin 0.5 gm., diluted alcohol 25, fifteen to twenty drops of this solution in an ounce of water). If the patient is unable to clean the tongue himself, it should be done for him with gauze saturated in the above solution; antiseptics such as **Mercurochrome** (2 per cent) or **Acriviolet** (1 in 100) are then applied. The treatment may have to be carried out at frequent intervals and for a considerable time.

REFERENCE.—*Med. Jour. and Record*, 1932, Sept. 21, 230.

HAND. (*See also FOREIGN BODIES IN THE EXTREMITIES; GANGLION.*)

HAND, DIVISION OF NERVES AND TENDONS OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

S. L. Koch and M. L. Mason¹ discuss these common injuries. They stress the importance of careful examination of the patient to determine the degree and extent of injury. They emphasize some obvious fallacies. A patient was seen two weeks after he had sustained a transverse cut over the volar surface of the right wrist. He had been operated upon less than two hours after the injury. His first words were, "I have had no feeling in the palm since the injury". The surgeon who operated wrote, "I know there was no nerve injury, for immediately after the completion of the operation the patient was able to flex all his fingers". Apart from the obvious fact that it is impossible to divide the flexor tendons by a transverse cut just above the wrist without dividing the median nerve, and that it is difficult to divide the tendons without dividing the ulnar nerve, it is often forgotten that even if both median and ulnar nerves are divided at the wrist the patient can flex his fingers if the flexor tendons are intact. The long flexor muscles receive their nerve-supply from the median and ulnar nerves high up in the forearm.

Text-books have made the picture of median and ulnar nerve injury unnecessarily difficult to visualize and remember, and these particular injuries are stressed because they are so common and so important. There are two pathognomonic signs of median nerve injury below the middle of the forearm—loss of sensation in the area of median nerve distribution, and the inability to rotate the thumb to face the fingers. Similarly there are two diagnostic signs of ulnar nerve injury below the middle of the forearm: loss of sensation in the area of ulnar nerve distribution, and loss of the ability to abduct the completely extended fingers from and adduct them to the midline of the hand. Such movements do not, of course, represent the entire motor function of the median and ulnar nerves, but they are unequivocal and diagnostic.

Koch and Mason rightly point out that these injuries are of a major kind and no operation should be performed except in a well-equipped operating theatre. Sepsis after operation is a great disaster, and wounds should be treated, as in the case of War wounds, by free excision of contaminated tissues and the introduction of **B.I.P.P.** after the method of Rutherford Morrison. If the conditions are not favourable for such an operation, it is wiser to close the superficial wound loosely with a few interrupted sutures and permit healing to occur before attempting to repair the injured tendons and nerves. A bloodless field is indispensable and a blood-pressure cuff should be used as a tourniquet.

REFERENCE.—*Surg. Gynecol. and Obst.* 1933, Jan., 1.

HAND AND FINGERS, INFECTIONS OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Unfortunately the true significance of even slight permanent disability to the hand is not fully realized. In the out-patients departments of the large hospitals an injured or infected thumb may be allowed to stiffen permanently in a position of adduction. This renders the hand useless from a labourer's point of view. Furthermore, the loss of fine co-ordinated movements prevents the performance of any artistic work. The treatment of infections and injuries to the fingers and hand has in recent years attracted minute consideration. Excellent results can be obtained if proper attention is given to fundamental principles.

Nils Eckhoff¹ regards the loss of function of one phalanx of one finger as a calamity of the first order. He says that every infected hand should be looked upon as an anatomical problem.

Subcuticular whitlow or infected blister should be treated by dissecting off the raised cutis and dressing with some spirit lotion. Such a superficial infection may spread to the deeper parts of the subcuticular layer or communicate with a subcutaneous collection.

In the case of *subcutaneous whitlow*, the finger becomes swollen, red, hot, tender, and useless. Fluctuation is not to be expected. The subcutaneous tissue is held in position by strong, well-marked fibrous strands forming definite loculi of fatty tissue. The condition progresses slowly. The formation of pus must rupture loculus by loculus as it spreads. Hot fomentations, poultices, etc., are to be condemned. All these subterfuges obstruct the diagnosis. It is best to give a general anæsthetic and use a tourniquet at the base of the finger or a pneumatic tourniquet on the arm for more extensive cases. The incision should never be over the middle line of the finger. A lateral incision may be extended into a horseshoe flap over the tip. A rubber dam is inserted and dry or hypertonic saline dressings are applied. The infection, if unrelieved, will progress insidiously until the tension is such that the blood-supply to the bone is cut off. The artery of supply to the bone runs through the pulp of the finger. Alternately, the bone may be involved by direct spread. Infection may pass along the finger proximally into the thenar or middle palmar space. Loss of the normal hollow of the palm is the diagnostic sign. The middle palmar space may be opened up by extending the lateral incision utilized on the finger and passing a pair of forceps deep to the long flexor tendons. The thenar eminence may be opened by an incision along the radial side of the dorsal aspect of the second metacarpal, going through the first dorsal interosseous muscle or, alternatively, through the web between the thumb and index finger. In nine cases out of ten there is no pus on the dorsum. The swelling is purely cedematous and incision is not indicated.

The spread of infection to the tendon-sheaths is serious and requires anatomical consideration. The sheath of the flexor longus pollicis runs from the base of the terminal phalanx of the thumb to a point an inch above the transverse carpal ligament. The sheaths for the index, middle, and ring fingers run from the base of the terminal phalanx to a point in front of the metacarpo-phalangeal joints. The sheath for the little finger communicates in the palm with the large common sheath of the flexor tendons which, in turn, extends above the transverse carpal ligament. This is sometimes called the ulnar bursa. It will be seen that infection of the sheath of the thumb or little finger is very much more dangerous than infection of the other fingers. Sheath infections are diagnosed by: (1) Uniform swelling of the whole finger; (2) Exquisite tenderness over the line of the tendon; (3) A maintenance of a position of flexion; (4) Pain on passive movements, especially extension.

A lateral incision should be made in the line of the tendon, opening the sheath freely.

Eckhoff summarizes his paper as follows: "I have indicated the importance and gravity of infections of the hand and fingers, especially those of the flexor aspect, and especially those occurring in certain trades—e.g., fishmongers and butchers. I have indicated how these infections must be classified anatomically. I have indicated the correct surgical treatment in each case. Rest, with splint and sling, and preferably in bed, is essential at first. A plaster splint in the 'position of function' (wrist dorsiflexed and fingers partly flexed) is excellent.

"Once the infection is in check, splints and dressings are to be removed for increasing periods daily, with the hand in a hot saline or hot air bath, and active movements are to be encouraged lest, following an infection of one finger, the whole hand is beset with an intractable stiffness.

"Hot moist dressings are to be avoided. Spirit solutions, hypertonic salines, or solutions of magnesium sulphate may be applied, provided always the incision is sufficient. Bier's hyperæmia is an excellent adjuvant, especially in lymphangitis, and is applied by placing a soft rubber band either around the finger or around the arm, not too tightly, for as long as the patient can tolerate it.

"I have not attempted to be exhaustive in this paper, but I have dealt with the commoner conditions as we see them in hospitals."

Paronychia.—Kanavel is responsible for the greatest advance in the treatment of this condition. It used to be the custom to pull the nail off, and to do little else. Eckhoff unhesitatingly condemns this as the wrong line of treatment. Granulations spring up about the nail bed, and a pocket is left with an overhanging flap of skin, which does not allow of free drainage, and usually takes six weeks or more to heal. Furthermore, the unaffected distal part of the nail is torn off, leaving a very tender finger.

The anatomical situation of the pus is between the proximal part of the nail and the nail bed. The correct treatment is thus to expose this by one or sometimes two lateral incisions, in the line of the edge of the nail, turning back the skin flap thus created, and to remove the *proximal* part of the nail only. The lateral incisions are to be made carefully to avoid damaging the nail bed, or a permanently split nail may result. A strip of vaselined gauze, which allows for free exit of discharges, is placed under the skin flap to prevent too early healing, though this may be discarded in a few days, and the finger is usually well in ten to fourteen days.

REFERENCE.—¹*Lancet*, 1933, i, 1276.

HARE-LIP AND CLEFT PALATE. John Fraser, Ch.M., F.R.C.S.Ed.

During the past year there has been a number of articles dealing with various aspects of hare-lip and cleft palate, but no contribution has materially altered the established conceptions.

H. O. Foucar,¹ in a paper of general interest, refers to the theories which have been advanced in explanation of the occurrence of these errors. He is inclined to favour the view of Cryer that hare-lip, and possibly cleft palate, arises from a mechanical factor, the mandible developing before the maxilla and exerting undue upward pressure, possibly because of increased flexion of the head, with the result that the right and left halves of the maxilla fail to unite. Foucar advises operation within a few hours of birth, and if for any reason this ideal cannot be achieved, he delays interference for two weeks in order to avoid post-natal jaundice with its risk of attendant hæmorrhage. He uses a modified Mirault incision, and it is interesting to notice that he does not recommend forcible replacement of the pre-maxilla, for he has every confidence that the pressure of a united lip will be sufficient to remodel the error.

V. Veau and P. Plessier² have discussed the treatment of bilateral complete hare-lip as reported in the *Bulletin* of the French National Surgical Society. Believing in the importance of avoiding any division of mid-line bony structure if the face profile is to be retained with any measure of symmetry, they rely on the muscular pressure of a closed lip to correct the deformity of a projecting pre-maxilla. They have accordingly adopted the technique of closing each half of the cleft independently, with an interval of three months between the operations.

W. Rosenthal³ contributes a long article on the operative technique of hare-lip and cleft palate. Its value lies in the description, illustration, and evaluation of a variety of different methods. It is evident that Rosenthal has been impressed by Veau's methods, and he, too, is careful to avoid any radical interference with the alveolar area. The remarkable effect which slight but persistent muscular force exerts in remodelling osseo-cartilaginous structures has long been recognized. Dentists have accepted its truth, and many surgeons have strenuously opposed suggestions which implied the use of wire and the forcible reposition of maxillary or pre-maxillary segments, for it is a fundamental principle that the best means of correcting body errors is to employ the natural forces which may be available. The increasing acceptance of this principle is perhaps the most striking feature in the progress of thought recorded over the past year.

M. Skinner⁴ believes that the treatment of complete hare-lip should start the day the baby is born, though the operation to close the cleft should not be undertaken until the child is a month or six weeks old. He says that, if the cleft edges are kept in apposition by adhesive strapping until the date of operation, the degree of narrowing which results is amazing. So far as the lip closure is concerned, Skinner, after paring the edges, unites the surfaces with two groups of sutures, the first consisting of interrupted sutures of fine waxed silk and embracing all the layers of the lip except the skin, and being tied on the mucous surface; the second group, of fine horsehair, accurately unites the skin edges and the red line of the lip.

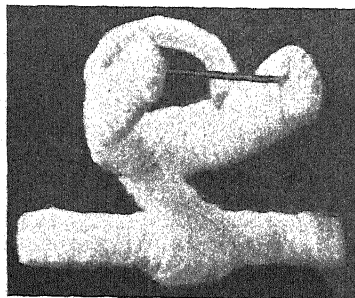


Fig. 44.—The Porzett splint prepared for application.

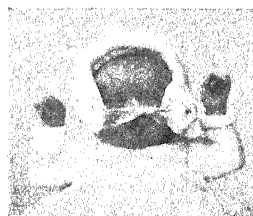


Fig. 45.—The splint in position.

(Figs. 44, 45 by kind permission of 'Zentralblatt für Chirurgie'.)

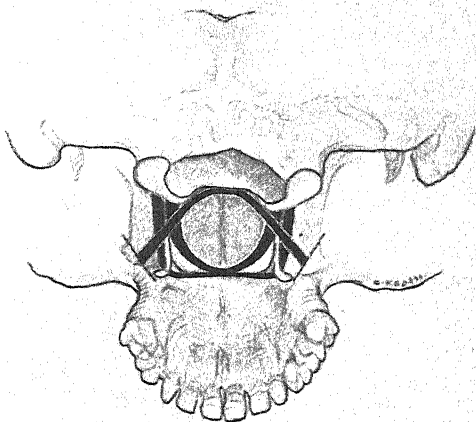
The dressing of hare-lip wounds is essentially a simple matter; some prefer to rely on the protective scale of the healing surface, a greater number choose the additional protection of an antiseptic paste such as B.I.P.P. If there is undue tension on the wound edges a Logan's bow affords some measure of security, and in one or other of these methods satisfaction is generally found, but difficulty is sometimes encountered in controlling the infant's hands and arms. In this connection W. Porzett⁵ describes a splint which he has

found efficient. Not only does it control the arms, but it is provided with a headpiece which prevents the child from rubbing its face against the bed-clothes. This head piece is provided with attachments by means of which a lip dressing can be kept in place, should such an addition be required (Figs. 44, 45).

Where cleft palate is concerned a number of papers have been reviewed. Rosenthal's article has already been alluded to. It might be described as a critical summary of the various operative methods, and it is a valuable paper from a reference point of view. The contributions of more individualistic character are three in number. D. Levi,⁶ in an article entitled "An Advance in the Surgery of Cleft Palate", expresses himself as a supporter of the methods described by Veau. These may be said to imply three principles: (1) Suture of the nasal mucosa; (2) Suture of the muscles of the soft palate; (3) Suture of the buccal mucosa. It is maintained that by these means there is complete epithelialization of raw surface, while any dead spaces are obliterated. Veau has devised individual operations for the four different types of cleft palate which he recognizes, but the principles already adumbrated are common to all the procedures. Those who have had an opportunity of seeing Veau's results are fully satisfied of the soundness of his technique.

Fig. 46.—Diagrammatic drawing of the base of the skull, showing the muscles forming the sphincter (in solid black). It shows the formation of the two slings, and omits the palato-pharyngeus as complicating the picture. There is, of course, a certain amount of distortion in order to force a scheme of three dimensions into the limits of two.

(Figs. 46-48 by kind permission of the 'British Journal of Surgery'.)



Denis Browne⁷ introduces a paper of outstanding interest with a discussion of the method by which closure of the communication between the oral and nasal cavities of the pharynx is effected. It is obvious that such closure is essential if the process of swallowing is to be efficient, and if phonation is to be satisfactory. It is sometimes represented that closure is secured by raising the soft palate so that it comes into contact with the posterior wall of the pharynx, the process being made more complete by the simultaneous elevation of a muscular ridge (Passavant's ridge) on the posterior pharyngeal wall. Browne is convinced that the mechanism is actually of the nature of a muscular ring or sphincter, the posterior part of which is formed by a portion of the superior constrictor overlaid by the palato-pharyngeus, while the anterior portion is formed by the two levatores and the two tensores of the palate (Fig. 46).

Accepting this as the normal physiology, he recommends that closure of

palate defects should be secured by what he describes as a muscle transplantation. Taking advantage of the fascial plane of the pterygo-mandibular raphé,

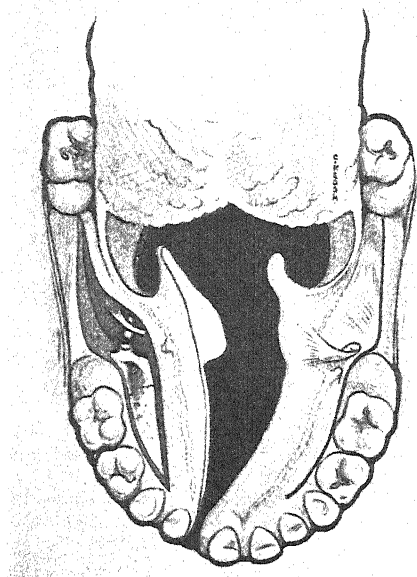
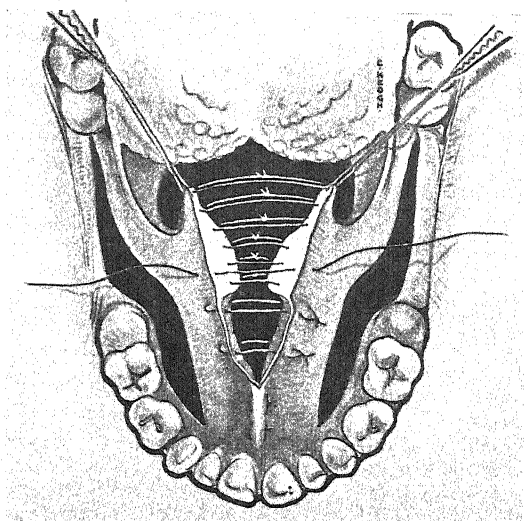


Fig. 47.—Diagrammatic drawing of a complete single cleft. On the right side the line of incision is marked out: the hamulus, the tendon of the tensor, and the posterior palatine artery, are shown as though the mucosa were transparent. On the left side the palate, both hard and soft, has been freed ready for suturing. In the bare palate bone left by its inward shifting can be seen the stump of the artery, which has been cut at a previous operation, while the hamulus is broken off its base and has fallen inwards. Of course the tendon of the tensor palati should not be exposed as it is in the drawing.

Fig. 48.—Diagrammatic drawing of the stitching of a cleft of the soft and half the hard palate. Both sides have been freely mobilized, and a ruck has been raised at the apex of the cleft by two mattress sutures. Two vertical mattress sutures evert the edges of the mucoperiosteum, and the sutures on the nasal surface of the soft palate are shown in place. A single one of the six sutures which will join the oral surface has been inserted.



an incision is made through the mucosa along this line, the result being that those muscles which lie to the medial side of the raphé (the superior constrictor,

the palato-pharyngeus, the tensor and the levator palati) are liberated from their lateral attachments and displaced towards the middle line. To ensure a further degree of laxity of the tensor palati the tip of the hamulus of the pterygoid is snapped off with the finger-nail (*Fig. 47*). The further stages of the operation are the separation of the mucoperiosteum from the hard palate, the detachment of the muscular and fibrous attachments of the soft palate from the posterior edge of the hard palate, and the paring of the cleft edges. The suture of the edges of the defect is accomplished in the usual fashion

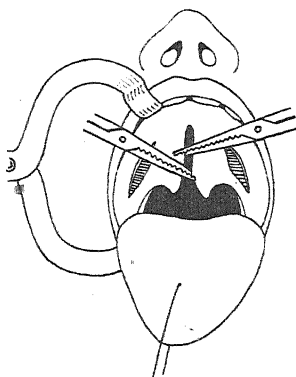


Fig. 49.—End of first stage.

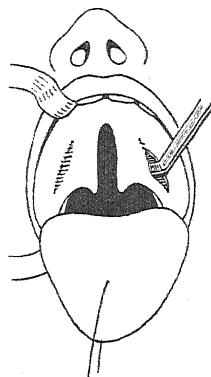


Fig. 50.—Beginning of second stage.

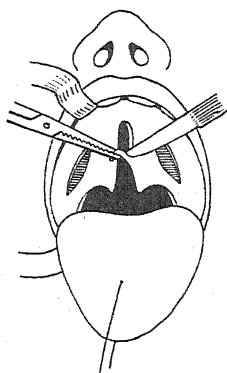


Fig. 51.—Second stage.

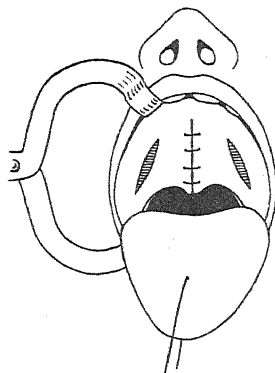


Fig. 52.—End of second stage.

(*Figs. 49-52 by kind permission of the 'British Journal of Surgery'.*)

(*Fig. 48*). Browne advocates that three months before the main operation is completed a re-arrangement of the blood-supply should be secured by division of the posterior palatine artery of each side through small incisions. No record of results is given, but this information is promised at some future date. The reviewer has put the procedure advocated by Browne to the test of practical experiment, and he is satisfied that so far as the securing of primary union is concerned the method affords satisfactory results. He is doubtful of the necessity for preliminary division of the posterior palatine

vessels, and in recent cases he has abandoned this detail without sacrificing any advantage. The real value of the operation is the remarkable relief of tension and the ease with which coaptation of buccal surfaces can be secured. The laxity of the parts after closure is such that the ultimate functional results will probably prove much more satisfactory than those in which closure is completed under tension.

A. Mitchell⁹ is an advocate of what he describes as a two-stage operation. He recounts the disappointment with which he regards the results of the past twenty years, an expression of opinion which is to be admired for its honesty, and which will be shared by many who are engaged in similar work; but, since practising the two-stage operation, the results have improved so much that there has only been one complete failure in the last ten cases. The procedure adopted is as follows. At the preliminary operation the mucoperiosteum is separated from the hard palate through relaxation incisions lateral to the posterior palatine artery. At this stage, too, the musculo-aponeurotic attachments of the soft palate to the posterior edge of the hard palate are separated. Two to three weeks later the flaps are separated again, the cleft edges pared, and closure secured by means of silkworm gut with superficial stitches of fine catgut (*Figs. 49-52*).

The paper concludes with an interesting note on the anæsthetic by F. J. T. Bowie. The anæsthetic technique is as follows. The bowel having acted on the forenoon of the day prior to operation, a 5-grm. chloretone suppository is given in the afternoon, and is repeated on the morning of the operation. Forty-five minutes before the operation $\frac{1}{150}$ gr. of atropine is given hypodermically and $\frac{1}{2}$ to 1 gr. of nembutal is administered by the mouth. Thirty minutes before the operation a rectal anæsthetic is introduced consisting of equal parts of olive oil and ether, the dose being reckoned as 1 drachm for every 2 lb. of body weight, 1 drachm of paraldehyde being added to the ultimate amount of the mixture. The administration requires from twenty to thirty minutes, and if it is insufficient at the commencement of the operation a few drops of ether may be given on a mask.

Such is a summary of the opinions which have been expressed during the past year in relation to the surgery of hare-lip and cleft palate. An observer cannot fail to be impressed by the many variations of technique which have been suggested, and from which good results have been claimed. Such an ebb and flow of opinion can only mean that the ideal technique has not yet been realized, and that we are still in what might be called the experimental stage. Looking back on the past year, however, one has the impression that surgeons tend to adopt procedures which imply the minimum of interference with the tissues. Evidence of this welcome appreciation is seen in the employment of the muscular forces of the lip as a means of replacing the premaxilla rather than by division of the vomer or wiring of the bone in position. The same conception underlies Denis Browne's argument that it is better to transpose the muscles of the soft palate and thereby secure a relatively tensionless suture line than to remain satisfied with a plastic repair which is accomplished by the aid of wire sutures and tension stitches. Working along simple lines, the avoidance of any gross destruction of tissue and the restoration of a disturbed physiology are the aims towards which successful cleft palate and hare-lip surgery in the future is likely to strive, and by these means the best results will be obtained.

REFERENCES.—¹*Canad. Med. Assoc. Jour.* 1933, April, 373; ²*Bull. et Mém. Soc. nat. de Chir.* 1932, July, 1079; ³*Zentralb. f. Chir.* 1932, Sept. 24, 2345; ⁴*Alabama Med. Assoc. Jour.* 1933, Jan., 253; ⁵*Zentralb. f. Chir.* 1932, Sept. 3, 2165; ⁶*Lancet*, 1933, i, 515; ⁷*Brit. Jour. Surg.* 1932, July, 7; ⁸*Ibid.* Oct., 214.

HAY FEVER. (See ASTHMA AND HAY FEVER.)

HEART DISEASE. (See also ARRHYTHMIAS; CORONARY ARTERY DISEASE; ELECTROCARDIOGRAPHY; PERICARDIUM, AFFECTIONS OF; SYPHILIS OF THE HEART AND ARTERIES; and other articles below.)

A. G. Gibson, M.D., F.R.C.P.

C. F. Coombs¹ gave a useful classification of the incidence of the important kinds of organic disease of the heart in private, hospital, and post-mortem practice. The post-mortem figures are probably less accurate in that those who come to post-mortem are a selected group. Combining hospital and private practice, the commonest group is the arterial group including coronary disease with 44 per cent, then comes rheumatism with 31·7 per cent, while the cardio-renal group with a systolic blood-pressure of over 200 is 11·2 per cent. The next group are the thyrotoxic cases 6·9 per cent, followed by endocarditis (non-rheumatic) 5·9 per cent, syphilis 4·6 per cent, and congenital heart disease 1·7 per cent. In the examination, therefore, of any clinical case of cardiac disease it is well to remember that rheumatic and arterial types include nearly 87 per cent of the whole.

E. W. Jones² makes some observations on the etiology and symptoms of *mitral stenosis*. Of 300 cases, 214 had a rheumatic history, in 57 there was no rheumatic history, and no etiological factor was found in 29. In the group with no rheumatic history the patients dated their symptoms from some infective disease, of which the commoner were influenza, tonsillitis, scarlet fever, and pneumonia. In many of the cases with no etiology at all the disease was found unexpectedly in a routine examination. Mitral stenosis is more common in women than in men (3 : 1), and the majority of cases over 45 years develop auricular fibrillation. Though on a conservative estimate the etiological factor from these figures is known in 80 per cent, the writer believes that 90 per cent is nearer the figure in the series.

Tuberculosis of the myocardium is a very rare complication, but it is well to record the observations of B. A. Gouley, S. Bellet, and T. M. Macmillan,³ who report 6 cases of this disease and review the previous writings on the subject. The age incidence lies between 16 and 45, and the chief site is the auricles, more commonly on the right. The simplest classification is based on the manner in which tuberculosis reaches the myocardium: (1) By direct extension through the mediastinal glands from the pericardium; and (2) From dissemination by the blood-stream from some extracardiac focus. Under the first group caseous tumours of moderate size with accompanying granulation tissue may be present in the auricular walls. In the second the lesions may be seen in relation to vessels, and there may be arterial or venous erosion, thrombosis, and the replacement of the wall of the vessels by tuberculous granulation tissue. In regard to the diagnosis, the common clinical antecedent is tuberculous pericarditis, but the authors lay stress on the importance, in all tuberculous disease elsewhere, of the development of ectopic rhythms such as auricular fibrillation and extrasystoles, which may mean myocardial tuberculosis.

Aortic Valvular Disease.—M. Campbell,⁴ from a series of cases with disease of the aortic valve collected from Guy's Hospital, reported that 50 per cent were due to rheumatism, 27 per cent to syphilis, and 10 per cent to atheroma. The remaining cases were due to other causes. Of the rheumatic type, aortic incompetence alone accounted for 21 per cent and aortic stenosis and incompetence for 17 per cent. If mitral stenosis existed, aortic incompetence was found in 44·5 per cent and stenosis and incompetence in 17·5 per cent. In the rheumatic cases 30 per cent with mitral stenosis presented

fibrillation, which was only present in 8 per cent in those without mitral stenosis and in 3 per cent in all other causes. Fibrillation, therefore, is very rare in aortic regurgitation apart from mitral stenosis. In the blood-pressure readings the systolic pressure is lowest in the rheumatic cases with aortic stenosis, the average figure being 125 mm. The average systolic pressure was higher in the rheumatic cases with other complications, and was highest in syphilitic incompetence, being 166 mm. It was 160 mm. in atheromatous cases. A high maximum pressure, therefore, is more likely to be found in the syphilitic and atheromatous groups. Electrocardiograms showed left ventricular predominance in half the cases of those with pure aortic disease.

The Heart in Hyperpiesis.—M. Campbell,⁶ in a clinical lecture given at Guy's Hospital, mentions the following clinical points about high blood-pressure. Two important clinical signs have to be considered: the size of the heart, and the presence or absence of a mitral systolic murmur. A high-pressure reading with a heart that is not enlarged suggests that the high blood-pressure reading is not constant but intermittent. An apical systolic murmur means not valvular disease but dilatation of the left ventricle at the auriculo-ventricular ring. It is an indication of a stage in the heart's downward progress, though it may be present for many years. One of the first auscultatory signs of high blood-pressure is the accentuated second sound at the aortic area. Gallop rhythm again may be detected in the course of hyperpiesis. Sometimes it is caused by reduplication, sometimes of the first, sometimes of the second, sound. If it occurs with a high pulse-rate, it suggests a failing myocardium and a fatal issue. Pulsus alternans is an important sign of muscular failure of the left ventricle. Its presence can readily be defined by the sphygmomanometer with an external pressure towards the limits of the maximum blood-pressure. By this method much smaller examples of pulsus alternans can be ascertained (M. E. Shaw⁶). In determining the state of the arteries the retinal arteries give a better estimate than the brachial or radial and are more likely to indicate the condition of the cerebral arteries. The most important points are a silver-wire appearance and a distortion of the vein where an artery crosses it.

J. S. McQuiston and E. V. Allen⁷ examine the operation risk in patients with hypertension. The records of 350 patients were studied on whom major surgical operations had been performed, and they find a mortality of 2.6 per cent, which is approximately the same as that of a group of unselected cases upon whom the same operations had been performed. Even when hypertension occurs with mild myocardial or renal insufficiency the risk appears to be no greater than in unselected cases.

C. Bruen⁸ recommends the use of **Bismuth Subnitrate** for hypertension. The reduction in pressure is dependent on the action of the nitrate and is comparable to that of the nitrite group. The author suggests a gradually increasing dosage starting from 5 gr. until the maximum reduction has been obtained.

Thyroid Heart.—L. M. Hurxthal⁹ mentions that in hyperthyroidism the cardiovascular features are: (1) An increased rate and amplitude of the cardiac contraction; (2) Auricular fibrillation and very occasionally auricular flutter; (3) The systolic blood-pressure raised and the diastolic lowered; (4) An underlying angina pectoris may be brought out or intensified; (5) Congestive heart failure may develop either with normal or with abnormal rhythm (fibrillation). Successive heart silhouettes in the course of treatment indicate a lessening in the heart diameter. Hyperthyroidism does not produce characteristic histological changes, neither does it produce gross cardiac hypertrophy or hypertension. Auricular fibrillation and flutter are the only arrhythmias caused

by hyperthyroidism. Lesions of the conducting mechanism are not seen. The use of **Digitalis** and **Quinidine** may be required to produce a regular rhythm after operation if this has failed to render the heart regular.

H. Cookson¹⁰ draws attention to the points in the shape and size of the heart in goitre. The main difference of the heart silhouette when looked at antero-posteriorly lies in a projection between the knob of the aorta and the left ventricle. This is probably due to the increase in the volume of blood contained in the great vessels, especially the pulmonary artery, and to the greater excursion of their walls at each pulse wave. Post-mortem measurements show that there is an increase in the diameter of the pulmonary artery as compared with the aorta, and injection of fluid under pressure into the right ventricle in the cadaver while the heart is *in situ* leads to a similar prominence of the pulmonary artery. There is a general slight enlargement of the shadow especially to the left, a high aortic arch, and a prominent superior vena cava. In general the shape of the heart may be compared to that of a ham.

The subsequent history, after operation, of patients with hyperthyroidism is the subject of a paper by H. H. Rosenblum and S. A. Levine.¹¹ The paper is very detailed and only a few items can be mentioned: 69 cases altogether were followed up—43 had congestive heart failure, 9 angina pectoris (2 of these had coronary thrombosis), 15 had mitral stenosis, and 4 had doubtful mitral stenosis. There were 2 with aortic insufficiency, 1 syphilitic and 1 rheumatic. The subsequent history showed that there was marked immediate improvement following the operation and that the improvement was well maintained. Of 32 patients with persistent auricular fibrillation, the irregularity remained in 10. These were all patients with mitral stenosis. Those with transient auricular fibrillation may be expected to become entirely free from such attacks, while in those with mitral stenosis the condition persists. Five cases with paroxysmal auricular flutter showed no return of the attacks. There was marked clinical improvement in those cases with anginal attacks. If the attacks did not cease, they occurred at much longer intervals and became less severe. The authors' opinion is that these cases were suffering from angina pectoris in addition to hyperthyroidism and that the improvement was caused by relieving the circulation of an extra burden. They do not think that hyperthyroidism alone causes anginal symptoms. Only 6 out of 43 patients with congestive cardiac failure died, and most of them improved very markedly. Up to the time of writing 6 patients had survived seven years and the greater number of these were able to resume their ordinary duties. In one case the thyroid was found histologically to be normal, and it is assumed that in this case the thyroid secretion was not in excess. The patient was a woman aged 61, who had been bedridden for many months with general anasarca, cardiac enlargement, auricular fibrillation, and moderate hypertension. The B.M.R. was plus 23 per cent. As a result of benefit from Lugol's solution a subtotal thyroidectomy was performed. After this she ceased to be oedematous, lost 50 lb. in weight, and became ambulatory. It is doubtful whether this was a normal case of hyperthyroidism, and yet improvement was marked.

F. Bach and G. Bourne¹² attempt to decide the question whether organic cardiovascular disease is permanent after thyrotoxicosis. In 26 patients who had previously suffered from thyrotoxicosis but had recovered they found no sign of cardiovascular abnormality. They conclude, therefore, that no permanent change occurs. On the other hand, thyrotoxicosis may initiate a hyperpiesis in those persons prone to that condition. Five of these cases were investigated and two further cases in which rheumatism had been a factor.

J. R. H. Towers¹³ writes an interesting clinical paper on masked hyperthyroidism as a cause of heart disease, which has been touched upon in the MEDICAL ANNUAL from time to time. No apology is needed for referring to it again, because of the great difficulty of these cases in practice. The patients themselves are cardiac patients and complain of cardiac symptoms. Palpitation is the most constant symptom, not a commonplace palpitation, but something that even a sensible patient looks upon as a besetting illness. The commonest basis for this is a simple tachycardia which may occur frequently in the twenty-four hours, be gradual in onset and offset, be precipitated by exertion and emotion, and be relieved by rest. Extrasystoles with a rapid heart-rate are frequently seen, and this combination, unusual in other cardiac disease, is of value in pointing to the thyroid. Paroxysmal auricular fibrillation is sometimes associated with the thyrotoxic condition. The attacks are independent of exertion or emotion. They may occur over a number of years and be followed by established fibrillation. This fact had been stressed previously by Parkinson and Campbell.

Of 15 patients, simple tachycardia was found in 4, the same with extrasystoles in 4, paroxysmal fibrillation in 4, ventricular extrasystoles in runs in 1, and established fibrillation in 2 patients. Breathlessness alone and apart from palpitation is not common. Anginal pain is sometimes seen. Of cardiac signs, overaction is constantly present, the impulse of the apex beat is short, quick, and forcible, and is quite unlike the sustained heave of that in hypertrophy. It is exactly the same as the apex beat of the normal heart immediately after exertion or during emotion. These features are present in patients after they have been lying down for at least half an hour to exclude accidental circumstances. The first sound at the apex is louder, shorter, and higher-pitched than normal, so that a presystolic murmur is simulated. The electrocardiogram shows little characteristic except that the P wave is occasionally increased in size. On X-ray examination the pulmonary are seen in the anterior posterior position between the aortic knob and the left auricle is fuller than normal. Examination of the thyroid gland may show no enlargement, but the consistency may be altered. The gland may be very firm and nodules may be detected.

Of associated symptoms and signs, tremor is almost always present, exophthalmos rarely, and von Graefe's sign frequently. There may be a slight loss of weight, which, if it occurs in bed with unimpaired appetite, is of considerable diagnostic value. Some patients do not lose weight at all. Flushing and moistness of the skin is often apparent, and to this, in the reviewer's experience, may be added the velvety texture of the skin, simulating that of an infant. A patchy pigmentation of the skin along the base of the neck and on the shoulders is occasionally present. Other symptoms are unexplained attacks of diarrhoea, increased nervousness, and a quickness of movement suggesting fidgetiness. Occasionally there is premature greyness of the hair and vomiting attacks. A majority of the patients have shown an increased metabolic rate. In the absence of treatment of the thyroid, these patients present symptoms and signs for long periods, even up to several years. In a second group the symptoms may be recurrent and intermittent. The difficulties of diagnosis lie in distinguishing it from mitral stenosis and raised blood-pressure; occasionally also from pulmonary tuberculosis and effort syndrome. An important point in diagnosis is the failure of rest and digitalis therapy to affect the condition.

PROGNOSIS IN HEART DISEASE.—S. A. Levine¹⁴ writes an interesting paper on the factors concerning prognosis in heart disease, and says that mistakes

in prognosis, more than those of treatment, are responsible for the activities of numerous unorthodox medical cults to-day. He indicates the more important items upon which a prognosis should be made. In regard to the pulse-rate, he mentions that in mitral stenosis with auricular fibrillation a high pulse-rate is a better prognostic sign than a low rate for the reason that digitalis therapy can be pushed further and exerts its effect more on the patient with a high pulse-rate. In general the larger the heart, other things being equal, the poorer the prognosis. He refers to the importance of infection in producing symptoms and signs in heart disease and to the fact that the removal of the infection may produce an altogether different outlook for the patient. This is especially so in rheumatic heart disease, from which patients recover to a remarkable degree. Some patients with dyspnoea may have a good outlook for the reason that their dyspnoea may depend on a pulmonary rather than a cardiac cause. This is well seen in some old people in whom the dyspnoea is from emphysema; the same is true of fibroid lung.

Obese patients may suffer from dyspnoea in the absence of cardiac disease, and obesity therefore is an important factor in assessing the prognosis when cardiac disease is also present. A prognosis can also be based sometimes on the facility with which symptoms such as dyspnoea, oedema, and chest pain disappear under treatment. Oedema of the legs, for instance, that develops only at the end of the day and disappears overnight, is less serious than that which persists all the day. In mitral stenosis the development of hypertension makes the prognosis better. When patients with mitral stenosis suffer from cardiac failure the outlook is better than when cardiac failure comes on with aortic stenosis or insufficiency. In the former case several attacks may be recovered from, in the latter the deficiency usually persists. Cardiac asthma has a grave outlook and indicates the same or a poorer prognosis than the presence of *pulsus alternans*, gallop rhythm, or bundle branch block. Levine mentions patients that have developed *pulsus alternans* and gallop rhythm observed for more than five years. Incidentally he points out that a serious cardiac event like coronary thrombosis may cause a temporary phase of *pulsus alternans*. When cardiac embarrassment or failure occurs in thyroidal disease the prognosis is good so long as hyperthyroidism can be properly treated. When nephritis complicates cardiac embarrassment or failure in the so-called cardio-renal cases the outlook is grave. In any case of cardiac disease accidents such as subacute bacterial endocarditis or emboli render the prognosis more serious.

The author notes that patients with persistent auricular fibrillation do not develop subacute bacterial endocarditis, and that those most likely to succumb to this infection are patients who have been fairly strong and comparatively free from dyspnoea or recurrent attacks of rheumatism. It is more common in the well-compensated patients with valvular disease of the mitral or aortic type.

In the discussion which followed this paper, B. E. Hamilton referred to the necessity of removing cardiac burdens such as obesity, thyroid disease, and infections. In regard to the outlook of mitral stenosis and pregnancy, he said that the death-rate could be reduced ten times by careful control of the patient's daily régime.

C. F. Coombs,¹⁵ in attempting to assess the prognosis from a study of 144 clinical cases of coronary thrombosis, said that of those who survive the initial attack one-third die during the year following. The severity of the attack is a guide to the future outlook. A good indication of its severity is in the amount of the fall of pulse-pressure. In the later stages following the attack the severity of the lesion may sometimes be estimated from

the electrocardiogram. Fatal attacks are more common when pericardial friction is not heard. Abdominal pain is of rather more serious import than thoracic.

REFERENCES.—¹*Clinical Jour.* 1932, Dec. 28, 613; ²*Brit. Med. Jour.* 1933, i, 307; ³*Arch. of Internal Med.* 1933, Feb., 244; ⁴*Guy's Hosp. Rep.* 1933, April, 168; ⁵*Clinical Jour.* 1933, July, 270; ⁶*Brit. Med. Jour.* 1933, i, 957; ⁷*Amer. Jour. Surg.* 1933, July, 72; ⁸*Jour. Lab. and Clin. Med.* 1932, Nov. (abstr. *Jour. Amer. Med. Assoc.* 1933, March 18, 851); ⁹*New Eng. Jour. Med.* 1933, March 9, 538; ¹⁰*Proc. Roy. Soc. Med.* 1932, Aug., 1517; ¹¹*Amer. Jour. Med. Sci.* 1933, Feb., 219; ¹²*Quart. Jour. Med.* 1932, Oct., 579; ¹³*Lancet*, 1932, i, 67; ¹⁴*New Eng. Jour. Med.* 1932, July 28, 173; ¹⁵*Bristol Med.-Chir. Jour.* 1932, Winter, 277.

HEART DISEASE, CONGENITAL. (See also PATENT DUCTUS ARTERIOSUS.)

A. G. Gibson, M.D., F.R.C.P.

Coarctation of the Aorta.—William Evans,¹ in an anatomical and clinical study including 28 cases, subdivides this condition into six anatomical types. The first type is that where the stenosis is accompanied by a patent ductus arteriosus and hypoplasia of the proximal part of the aorta. Cases in this group are mainly young children of a few weeks old, the oldest in Evans' series being 8 years. Hypertrophied arteries forming part of a collateral circulation were not observed. The second type is where the ductus arteriosus is closed and there is hypertrophy of the proximal portion of the aorta. This group comprises patients of all ages up to 60 years. The third type is that where there is occlusion of the distal portion of the aortic arch as well as of the ductus arteriosus, and hypertrophy of the proximal portion of the aorta. This type includes those in which the collateral circulation is a prominent feature. The fourth, fifth, and sixth types are found in infants who live but a few days. The fourth is an interruption of the aortic arch in its distal portion, a widely patent ductus arteriosus, and hyperplasia of the proximal portion of the aorta. The fifth is congenital atresia of the proximal portion of the aortic arch and a patent ductus arteriosus. The sixth is congenital absence of the ascending aorta and a patent ductus arteriosus. Many other congenital deformities, not only those of the heart, were noticed in the series.

In regard to diagnosis, it is rare for adults to refer to any particular ailment that has caused the illness. One symptom, however, may be important. As illustrated in his Case 9, the patient complained of numbness and weakness of both legs whenever he assumed an upright posture after having been in the horizontal position. The sensation was that of blood running back to the legs. The difficulty of keeping the feet warm was also complained of by this patient. In Types 2 and 3 hypertrophy of the left ventricle and a forcible, downwardly displaced apex beat is usual. Aortic incompetence was found in 2 out of the 3 cases in this group. In these groups also the collateral circulation is most evident, the details of which have been referred to in previous editions of the MEDICAL ANNUAL. While in normal subjects the systolic pressure of the femoral artery exceeds that in the brachial by 20 to 40 mm. of mercury, in coarctation with a closed ductus arteriosus the reverse is the case, a very wide difference being sometimes noted. The X rays in Types 2 and 3 show enlargement of the left ventricle, the ascending aorta projects prominently to the right, and the aortic knuckle to the left may be small or absent. The cause of death in 13 out of the 26 cases referred to was heart failure, with an average age of 2 years 11 months.

Three clinical cases of this disorder have been reported by E. C. Eppinger and P. A. H. Midelfart.² They refer to the hypertension which, when it occurs in a young adult without renal disease, should indicate the possibility of coarctation. Another though less important feature is intermittent claudication of the legs. They refer to Abbott's series of 200 cases in which the cause of death

was cardiac failure, rupture of the aorta, cerebral accidents, and subacute bacterial endocarditis in that order of frequency.

G. F. Strong² records three further cases of coarctation of the aorta, and mentions dilatation of the aorta and rupture and hypertrophy of the heart as the most important anatomical changes. Complete obliteration of the thoracic aorta is compatible with life to adult years or even to old age.

REFERENCES.—¹*Quart. Jour. Med.* 1933, Jan., 1; ²*Amer. Jour. Med. Sci.* 1933, April, 527; ³*Canad. Med. Assoc. Jour.* 1932, July, 15.

HEART FAILURE.

A. G. Gibson, M.D., F.R.C.P.

P. D. White¹ in an interesting paper endeavours to make clear what are the *initial symptoms in weakness and failure of the left ventricle without failure of the right*. His conclusions are that the following symptoms and signs are important: (1) Dyspnoea of cardiac origin without mitral disease or congenital defects. The underlying effect in this condition appears to be an increase in pressure in the pulmonary circulation with engorgement of the blood-vessels. (2) Cardiac asthma and acute pulmonary oedema which may come on entirely without any previous symptoms. It occurs in serious heart disease, hypertensive enlargement, infarction from coronary thrombosis, aortic stenosis, and regurgitation. (3) The diminution in the vital capacity of the lungs may be a valuable test in doubtful cases. West's normal standard gives 2.5 litres of vital capacity per square metre of body surface for men, and 2.0 litres for women. (4) To the X rays there is an increase in the vascular shadows radiating from the hila of the lungs clearly distinguishable from the various patterns of pulmonary disease. (5) *Pulsus alternans*, proto-diastolic gallop rhythm, and increase in the intensity of the pulmonary second sound. There is a very careful discussion on the whole question and it throws light on well-known cardiac events, putting a significance upon them which is of prognostic importance.

S. McGinnand and P. D. White² have followed up 272 cases of *cardiac asthma*. They were most frequently males over 50 years of age with coronary heart disease. The average expectancy of life has been found to be about two years, and one out of four patients died within six months. Careful treatment has a tendency to prolong life, and very rarely a patient may become free of the attacks. Items of special gravity in prognosis are cardiovascular syphilis, congestive failure, or auricular fibrillation. Of some, though probably less, significance is the presence of *pulsus alternans* and gallop rhythm. The most effective treatment consists in the hypodermic injection of **Morphine** and the assumption of the **Upright Position**. **Venesection** may be of value in severe cases. The patients should be on a maintenance dose of **Digitalis** so as to obtain its full effects. This would appear to be a preventive of attacks.

S. Weiss and G. P. Robb,³ in a review of cardiac asthma, note that in those subject to this malady pronounced disability and orthopnoea were frequently associated with a normal venous pressure and adequate peripheral circulation. X-ray examination of the chest showed an enlarged hilar shadow, particularly towards the base of the lung. The diaphragm was low and its excursion diminished. The border of the left ventricle showed a slight excursion in contrast with the good excursion of the right cardiac border as seen in the left oblique position. Râles in the lungs were not often heard even when the X-ray features were marked, and the conclusion is that between the attacks the pulmonary circulation showed engorgement of the vascular bed, whereas the peripheral circulation was normal. The physical signs in the lungs were those of emphysema, increased anterior-posterior diameter of the chest, and increased resonance. The vital capacity was considerably diminished. In 10 per cent only of the cases were signs of bronchitis. The pulmonary second sound is

greatly accentuated during the attack, but not so in the interval. The skin assumes an ashen colour and the patient often breaks out into a cold sweat. There is intense dyspnoea and tachypnoea, and precordial pain is frequent. The pulse-rate during the attack is rapid and the sounds have a tendency to simulate those of the fœtus. In those instances in which electrocardiograms were obtained no essential change was observed. During the attacks pulmonary œdema may supervene, and the essential feature appears to be an increase in the volume of the pulmonary vascular bed and relative stagnation. This corresponds to a clinical condition of the lungs, which appear to be distended. One of the precipitating factors seems to be the horizontal position, for when the patient is propped up attacks are less likely. Further, anything that acts as a stimulant—noise, a paroxysm of coughing, or a full bladder—may excite an attack. The prognosis in these cases is serious; out of the 87 patients, 44 died within a year after being seen. When these patients improve, the pulmonary circulation first becomes normal. This is followed by a disappearance of functional emphysema. One of the conditions of the attack is a subacute failure of the left ventricle.

K. S. Smith⁴ brings forward evidence to show that in the treatment of *congestive heart disease* beneficial action can be expected from giving **Insulin and Glucose**, and he discusses the method by which this action is effected. Case histories of six patients are given with anginal symptoms, in all of whom there was considerable improvement and diminution of pain. The method adopted is to give 5 units of insulin subcutaneously, followed in fifteen minutes by 50 grm. of glucose or levulose by the mouth, daily. If no benefit follows in five days, the dose of both insulin and sugar is doubled.

In a paper by H. L. Blumgart, S. A. Levine, and D. D. Berlin,⁵ one of the authors had a cardiac patient who was suspected of having a masked hyperthyroidism, and a subtotal thyroidectomy was performed. Examination of the gland showed a perfectly normal thyroid, and yet in spite of this the patient showed marked clinical improvement. On this experience the authors asked themselves whether improvement could not be affected in congestive heart failure or angina pectoris if the metabolic rate were brought down by thyroidectomy, on the assumption that the heart would be in some degree rested. In three patients **Thyroidectomy** was performed; all of them were suffering from severe congestive heart failure but with no evidence of disturbed thyroid function. Another patient with angina pectoris who showed a slight elevation of metabolism but with a normal thyroid gland was also operated upon. All the patients had obtained the maximum of improvement possible from other medical procedures. In two or three patients with congestive failure thyroidectomy caused a fall in the metabolic rate, which reached its lowest three weeks after the operation. The lowered metabolism that ensued was accompanied by the disappearance of œdema, an increase in the vital capacity, and an ability to be up and about the ward without discomfort. Subsequently both these patients showed a rise in metabolic rate and their clinical condition became less favourable. The patient with angina pectoris showed no recurrence of attacks although returning to work and an active life. In one patient with congestive heart failure complete thyroidectomy without excision of the parathyroids showed conspicuous clinical improvement. It is doubtful if thyroidectomy could become a recognized method of treatment for cardiac failure; but the results in these patients point to the necessity of lowering the metabolic rate.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1933, June 24, 1193; ²*New Eng. Jour. Med.* 1932, Dec. 15, 1069; ³*Jour. Amer. Med. Assoc.* 1933, June 10, 1841; ⁴*Brit. Med. Jour.* 1933, i, 693; ⁵*Arch. of Internal. Med.* 1933, June, 866.

HEART, INFLUENCE OF CHEST DEFORMITIES ON ACTION OF.*A. G. Gibson, M.D., F.R.C.P.*

A severe degree of funnel chest (*pectus excavatum*) is always a startling thing when met with in practice, and it is surprising that there is so little disturbance of organic function. Funnel chest is a depression of the lower end of the sternum, and was first described in 1594. The deformity varies considerably in size and depth, from a slight depression to one in which the whole sternum is involved. In Woillez's famous patient, a young Viennese medical student, reported in 1860, the estimated distance between the anterior surface of the spine and the posterior surface of the sternum at its deepest part was 1 cm. The condition is either congenital or acquired, and numerous hypotheses have been put forward to account for it, but none appears to be quite satisfactory. The acquired type has been ascribed to rickets and obstruction of respiration. The reviewer has had to do with a most marked case in which the origin was clearly due to repeated attacks of pneumonia in childhood. It is curious that in the uncomplicated congenital cases there have been few complaints of cardiac symptoms irrespective of the size of the depression. Two cases have been reported by Sauerbruch and one by J. Edeiken and C. C. Wolfert¹ of a man who was symptom-free at 69 years of age and had never had any serious cardiac or pulmonary disorder.

In the majority of cases the deformity is noted at birth or early childhood and is comparatively small at first. The heart impeded in its growth by the depression is compensated by an increase in its transverse diameter. When the deformity is the result of an accident and rapidly formed, this accommodation does not take place and pain and dyspnoea are usually present. Some of these patients have a great deal of vitality, and one of those reported in the paper quoted was a cross-country runner and played ice hockey and tennis. The right border of the heart is difficult to outline by percussion and the apex beat is usually found out to the left even as far as the anterior axillary line. X-ray examination shows that the heart tends to be displaced upward and to the left. No abnormality in the electrocardiogram is found which can be attributed to the funnel chest. One case only, complicated by kyphoscoliosis and pigeon breast, showed evidence of cardiac decompensation. This was believed to be due to the spinal deformity and not to the funnel breast.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1932, Oct., 445.

HEART, SENILE. (See also ELECTROCARDIOGRAPHY.)*A. G. Gibson, M.D., F.R.C.P.*

T. J. Hoskin¹ gives a critical summing up of the symptoms of the senile heart, especially in its relation to operations on the prostate. As to the symptoms of cardiac abnormality in old age, he points to the consciousness of the heart's existence in the chest by the patient, and an accentuated second sound. The pulse-rate is easily affected by external stimuli and premature contractions are frequent. Irregularity of the action of the heart is not of any consequence so long as its reserve power is good, but the onset of premature contractions can never be passed over as unimportant because it may be a warning of a commencing myocarditis. Old patients frequently complain of a fluttering of the heart, which may be a physiological tachycardia or symptoms of a transient auricular fibrillation. It is necessary to find out what are the patient's habits in regard to tobacco and alcohol, for these may be the exciting factor. Tachycardia, again, may prove to be the first sign of an embarrassed circulation which may go on to congestive failure. Factors outside the heart are important as affecting cardiac action and efficiency, such as an over-distended bladder or the onset of uræmia. Heart-block is a symptom

met with, with or without Stokes-Adams attacks. Any tendency to anginal pain must be taken at its full seriousness. The electrocardiograph is an important help in assessing the state of the myocardium in these subjects. Changes in the electrocardiogram may be present when there is no indication in the history of a physical state. After the age of 60, the greater the age, the greater the operative risk, and the safety of the patient under any form of anaesthesia is most likely to be assured if a careful examination of the cardiovascular system is undertaken and all the disabilities are properly assessed.

REFERENCE.—*Clinical Jour.*, 1932, Sept. 21, 455.

HEART-BLOCK. (See ARRHYTHMIAS.)

HEREDITARY MULTIPLE TELANGIECTASES.

F. W. Walkyn-Thomas, F.R.C.S.

This condition, known also as 'Osler's disease', 'Goldstein's heredofamilial angiomatosis', and by several other names, is characterized by bleedings of unknown or unexplained origin (especially recurrent epistaxis) and superficial angiomatous lesions from minute red telangiectatic 'spots' on the skin and mucous membranes up to the angiomata of a size large enough to cause swellings of the lips and tongue.

Gordon Scarff¹ in a paper on familial multiple telangiectases of the skin and mucous membranes gives a most interesting family history of a group of patients suffering from this complaint. A woman who died at the age of 65 some years ago is said to have had swellings, apparently angiomatous, of the lips and tongue, and to have suffered from recurrent epistaxis. Neither her father nor her mother had any such trouble. She left 26 descendants, of whom 2 are now dead—one (a daughter who died of influenza) had the condition, the other (a son who died of some unknown cause) apparently had not. Fourteen of the survivors have recurrent epistaxis and 9 of the older ones have angiomata. One grandson has no trouble himself, but it is appearing in his son. Scarff has himself examined 8 members of the family and has obtained the history of the others. The clinical history is remarkably uniform: A healthy child, with no previous abnormality, begins to suffer from recurrent epistaxis of variable frequency and severity. There is usually no further development till about the age of 30, when telangiectatic spots appear on the face, lips, and tongue. These increase for a time and then are stationary. "Apart from secondary anaemia after severe epistaxis the condition does not give rise to any constitutional disturbance". None of Scarff's cases showed any abnormal tendency to other bleedings except that the male members seemed to bleed readily from hæmorrhoids. The menstruation of the females was normal and there has been no instance of pre- or post-partum hæmorrhage. Scarff confirms the observations of other writers that the condition occurs in, and is transmitted by, both sexes, with a slight female predominance. His opinion is:—

DIAGNOSIS.—In childhood the cause of the epistaxis can only be ascertained by inquiry into the family history. In adults the appearance of the spots and the normal blood picture exclude hæmophilia, purpura, and multiple nævi.

PROGNOSIS.—The condition is compatible with fairly healthy life and does not appear to shorten life to any great extent. Only five cases of all those recorded (five to six hundred) have died of hæmorrhage.

TREATMENT.—Limited to treatment of the secondary anaemia and of the hæmorrhage when it occurs. **Mild Antiseptic Oil** seems to diminish the number of nasal hæmorrhages, but application of the cautery does not prevent recurrence in another situation.

R. C. Larrabee and D. Littman² describe five cases occurring in two families. All the cases showed definite hereditary influence, numerous telangiectases with hæmorrhagic tendency, and blood pictures normal or showing only the usual anæmia secondary to hæmorrhage. They agree that "treatment is not very satisfactory". On the whole they have found that it is best to deal with actual bleeding spots by **Galvano-cautery** and to leave all other spots alone. They agree with Scarff that the death-rate is low (about 4 per cent), but they believe that many patients are continuously disabled after the age of 50. One of their patients had a complete bilateral ophthalmoplegia externa, which they regard as possibly due to an angioma of the mid-brain.

H. I. Goldstein,³ who with Osler and Rendu was among the first to distinguish the disease as a 'clinical entity', gives a full report of the literature up to 1932, and again emphasizes the normal blood picture, the telangiectasis and hæmorrhages, and the familial bisexual incidence. He points out that some patients have also enlargement of the spleen and liver.

C. Aubertin, R. Lévy, and Mme. Baclesse⁴ review our present knowledge on the subject. They point out that the mucosa of the bronchi and stomach are sometimes affected as well as the mouth, nose, and anal canal (one of the fatal cases was due to hæmorrhage from the lung). They deal very fully with the suggestion of Weil that the disease is due to abnormalities of liver function, and reject it on the grounds that there are no constant changes in the blood, which is usually normal in every way. They believe that the occasional changes found in the liver and spleen are late manifestations and are the effect, not the cause, of the hæmorrhages. Hæmorrhages due to blood conditions they classify as the *hæmophilic* where the coagulation time is lengthened, and *purpuric* where the coagulation is normal but the time of bleeding is prolonged.

In the condition under discussion they have noted two abnormal forms—'*formes frustes*' where there are either telangiectases without bleeding, or free bleeding—usually from the nose—without telangiectases. They regard the condition as a constitutional and hereditary endothelial dysplasia affecting the capillaries.

REFERENCES.—¹*Bristol Med.-Chir. Jour.* 1933, I, 113; ²*New Eng. Jour. Med.* 1932, Dec. 29, 1177; ³*Arch. of Dermatol. and Syph.* 1932, Aug., 282; ⁴*Presse méd.* 1933, Feb. 4, 185.

HERNIA.

A. Rendle Short, M.D., F.R.C.S.

Injection Method.—This form of treatment is growing in favour, though we do not hear of many British practitioners using it. It has been referred to several times in recent numbers of the MEDICAL ANNUAL. A simple and effective injection fluid is recommended by F. D. La Rochelle,¹ of Springfield, U.S.A. The formula is:—

R	Zinc Sulphate	4.0 grm.	Glycerin	15.0 grm.
	Phenol	24.0 grm.	Aqueous Solution of Butyn	
			(0.1 per cent.)	100.0 grm.

This makes an unstable suspension which is to be shaken up before using. It is advised that a truss should be worn for a few weeks before commencing treatment, to get over the initial truss-discomforts.

Recurrence after the Bassini Operation for Inguinal Hernia.—A follow-up of 718 cases of inguinal hernia treated by the Bassini method showed a death-rate of 0.49 per cent, and a recurrence-rate of 1.6 per cent (H. L. Foss and N. F. Hicken,² of Danville). The writers believe that silk should be used for the suturing instead of catgut, and report that it never gives trouble. D. Ostfield,³ of Berlin, reports 586 cases with 5.4 per cent recurrences (20 per cent for direct hernia). In W. Birkenfeld's⁴ series, also from Berlin, there were

5.2 per cent recurrences in 714 cases. He says that the main cause of failure is an innate hernia disposition.

Alternative Methods of Operating.—P. Turner,⁵ of Guy's Hospital, says that the weakness of the Bassini operation is that it does not take into account the condition of the fascial boundary of the posterior wall of the canal, which is part of the transversalis fascia. In old-standing herniæ there is a large gap

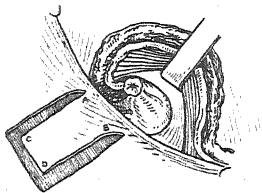


Fig. 53.—Flap of fascia lata with its attached base at Poupart's ligament.

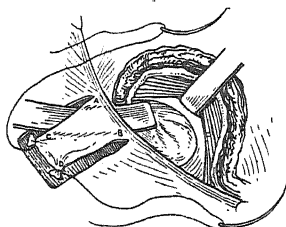


Fig. 54.—Curved metal spatula passed beneath Poupart's ligament into the inguinal canal.

in this at the internal ring, and bringing the feeble muscular fibres of the internal oblique in front of it is not sufficient. He therefore uses a pedicle flap of fascia lata with its base at Poupart's ligament to diminish the size of the opening. This flap is turned in beneath Poupart's ligament and sutured to the margin of the gap (Figs. 53-55). The method is specially suitable for long-standing ruptures in men past 45, for direct hernia, or for sliding hernia.

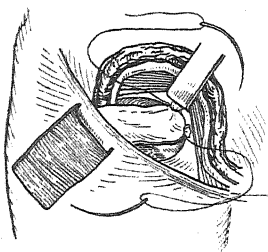


Fig. 55.—The flap of fascia has been drawn into the inguinal canal by traction on the sutures. (Figs. 53-55 re-drawn from 'Guy's Hospital Gazette'.)

H. R. Huston⁶ transplants the spermatic cord outside the external oblique aponeurosis, making a niche in it to avoid constriction. There were 12 recurrences (0.8 per cent) in 1500 patients. Local or spinal anaesthesia was used. M. Kirschner,⁷ of Tübingen, uses a similar method, kinking the cord outwards between the internal muscle and the external oblique aponeurosis (Plate XXIX).

H. Niessen and W. J. Potts⁸ discuss the results of the Schmieden method (see MEDICAL

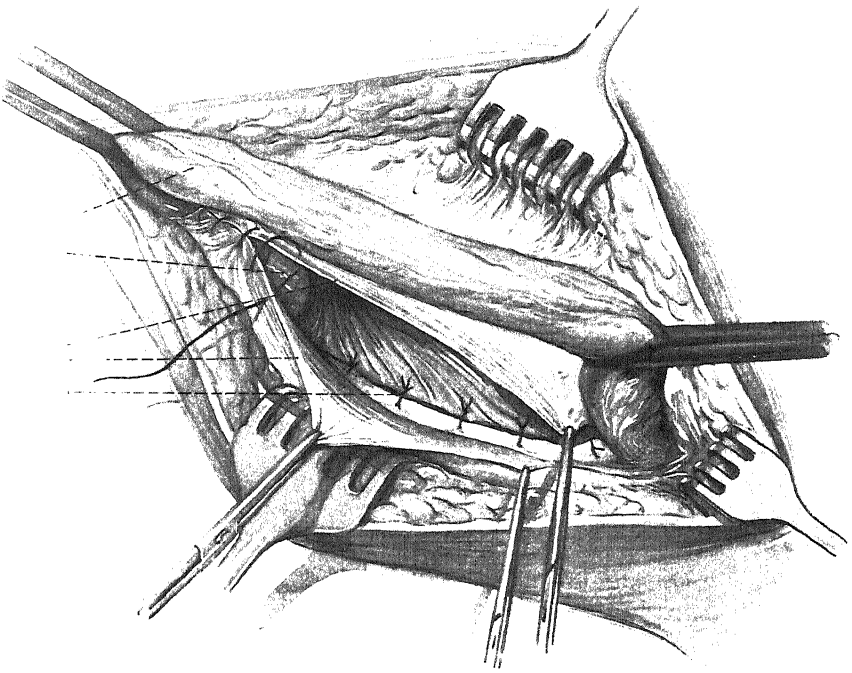
ANNUAL, 1931, p. 239). It was used for the more difficult type of case, and showed a recurrence-rate of 6.8 per cent.

W. E. Gallie,⁹ of Toronto, writing on the treatment of cases with a very large aperture, too big to allow of the sides being brought together by a strip of fascia lata used as a stitch, says that darning like a sock with fascial strips leads to a good many recurrences. He therefore advises in these, the most difficult of all hernias, a combination of the patch transplant with the living suture. The patch is taken from the fascia lata and its ends split into quarter-inch strips so as to resemble a many-tailed bandage. The patch is put into the gap and the 'tails' are passed through Poupart's ligament on one side and the internal oblique and conjoint tendon on the other; they are tied together to approximate these structures as closely as seems safe, and the knots in the 'tails' are secured with catgut stitches (Plate XXX). J. E. Fuld¹⁰ describes a fascial stripper used to obtain long strips of fascia lata subcutaneously.

PLATE XXIX

INGUINAL HERNIA

(M. KIRSCHNER)



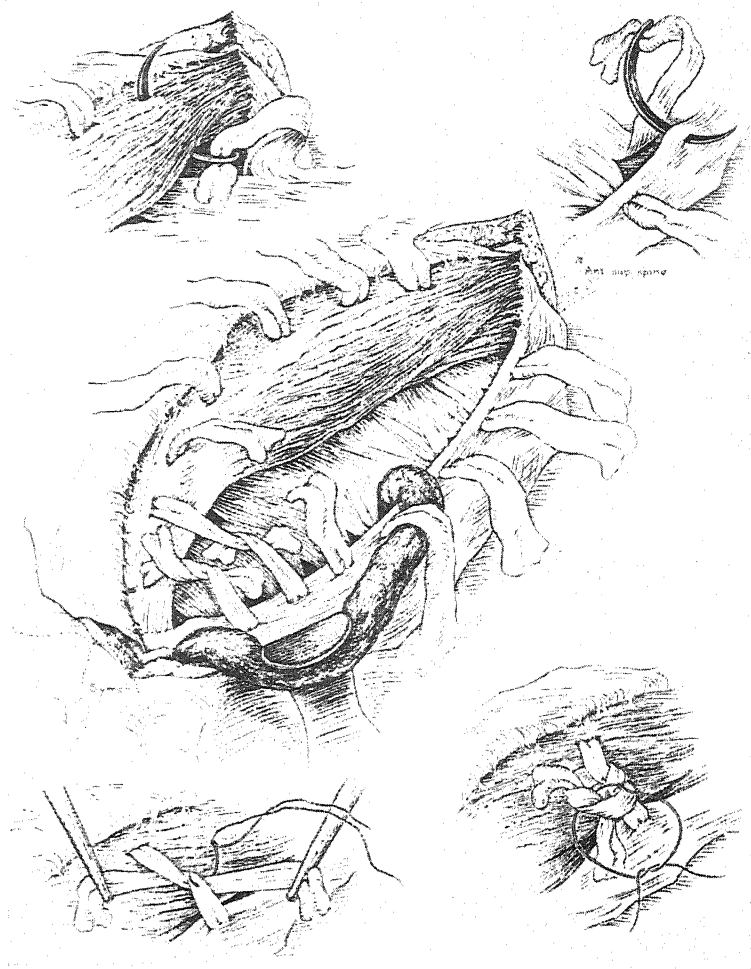
Kirschner's method of suture of the aponeurosis of the external oblique. The slit in the aponeurosis is stitched *under* the spermatic cord in such a way that, as this emerges from the internal ring, it is kinked so as to form a sharp hairpin bend as it lies beneath the skin.

By kind permission of the 'Archiv für klinische Chirurgie'

PLATE XXX

INGUINAL HERNIA—continued

(W. E. GALLIE)



Repair of posterior wall of inguinal canal by many-tailed fascial sheet.

Reproduced from 'Annals of Surgery'

The Final Stage of the Operation for Inguinal Hernia.—The commonest source of trouble after operation for hernia is a hæmatoma of the scrotum. This can be entirely avoided by the device here figured (Fig. 56). When the skin incision has been sutured, the bottom of the scrotum is stitched up to the anterior abdominal wall as high up as it can be pulled by a single silkworm-gut stitch. Any bleeding will thus flow from the cavity in the scrotum into the region of the incision. It is well to leave in a strip

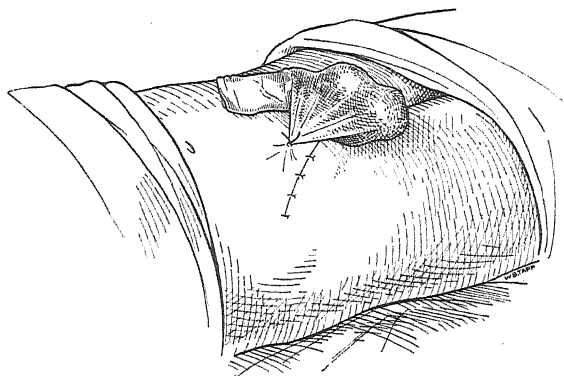


Fig. 56.—Showing scrotum stitched up to anterior abdominal wall to avoid hæmatoma.

of rubber dam. After twenty-four hours, the stitch and the rubber are removed. Since adopting this device several years ago the reviewer has never been troubled by a hæmatoma after the hernia operation.

Femoral Hernia.—Geoffrey Keynes,¹¹ of St. Bartholomew's Hospital, describes two cases of hernia directly in front of the femoral vessels. E. R. Easton¹² has on four occasions seen a femoral hernia develop after operative cure of an inguinal hernia.

REFERENCES.—¹*Med. Jour. and Record.* 1932, Sept., 184; ²*Amer. Jour. Surg.* 1932, Sept., 349; ³*Deut. Zeits. f. Chir.* 1933, May, 322; ⁴*Arch. f. klin. Chir.* 1933, March, 625; ⁵*Guy's Hosp. Rep.* 1933, April, 233; ⁶*Amer. Jour. Surg.* 1933, April, 122; ⁷*Arch. f. klin. Chir.* 1933, July, 357; ⁸*Amer. Jour. Surg.* 1932, Oct., 94; ⁹*Ann. of Surg.* 1932, Oct., 551; ¹⁰*Amer. Jour. Surg.* 1932, Dec., 514; ¹¹*Brit. Jour. Surg.* 1932, July, 55; ¹²*Jour. Amer. Med. Assoc.* 1933, June, 1741.

HICCUP.

Robert Hutchison, M.D., F.R.C.P.

This subject was fully dealt with in the MEDICAL ANNUAL for 1930 (p. 284). Charles W. Mayo¹ believes that many of the cases of post-operative hiccup there described are really identical with epidemic hiccup, and that both kinds are due to a specific streptococcus (*Streptococcus singultus*) isolated by Rosenow. As the majority of post-operative cases follow operations on the bladder, and as he has seen prolonged hiccup after simple prostatic massage, he is of opinion that the primary localization of the organism is often in the prostate. Both the epidemic and the post-operative cases run an average course of about nine and a half days. Specific treatment consists in the administration of **Encephalitic Antibody Globulin Solution**, the patient being first tested for hypersensitiveness to horse serum. From 2 to 5 c.c. of the solution should be given intramuscularly twice or thrice daily for two to three days. In most instances the hiccup is controlled in one to four hours after the first dose. In addition to specific treatment symptomatic measures are also adopted. These consist in the administration of **Sedatives** and **Analgesics** of various sorts. The

inhalation of **CO₂** and **Oxygen** for spells of fifteen minutes is also helpful, or **Self-anæsthesia** by ether or chloroform carried out by the patient whilst in a sitting position and without an arm-rest may give relief.

In cases following gastric operations the cause is usually either chemical irritation of the stomach or acute distension of it. In these circumstances **Gastric Lavage** and the use of **Alkalis** and **Carminatives** with mild laxatives is to be recommended.

If other measures have failed, and the hiccup has lasted for weeks, **Phrenicotomy** is indicated, or, in still more prolonged cases, **Phrenic Avulsion**, but such measures should not be lightly adopted.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1932, Dec., 700.

HODGKIN'S DISEASE.

Stanley Davidson, M.D., F.R.C.P.E.

In last year's *MEDICAL ANNUAL* (p. 223) reference was made to the *Rose Research on Lymphadenoma*, by M. H. Gordon, in which a specific infective agent was obtained from lymphadenomatous glands. Further researches¹ indicate that the agent is a virus resembling those found in trench fever and hog cholera, which have thermostable properties. The virus produces an encephalitis in guinea-pigs and rabbits, and a neutralizing antibody in the serum from an immune animal has been established.

C. E. Van Rooyen² has repeated Gordon's work and confirmed it. The author lays particular stress on the value of animal inoculation as a laboratory aid for the diagnosis of Hodgkin's disease, since lymphosarcomatous, leukæmic, and tuberculous tissues fail to produce a specific encephalitis when injected into the brains of rabbits. [The reviewer has sent glands from various types of cases to Dr. Van Rooyen, and can confirm the value of this biological test.—S. D.]

REFERENCES.—¹*Brit. Med. Jour.* 1933, i, 641; ²*Ibid.* 644.

HOOKWORM DISEASE. (See ANKYLOSTOMIASIS.)

HYDROCELE. (See TESTIS, ETC., SURGERY OF.)

HYPERPIESIS, THE HEART IN. (See HEART DISEASE.)

HYPERTHYROIDISM. (See THYROID.)

HYPNOTIC DRUGS. (See INSOMNIA.)

HYPOGLYCÆMIA.

W. Langdon Brown, M.D., F.R.C.P.

As shown in recent volumes of the *MEDICAL ANNUAL*, the subject of hyperinsulinism is now receiving much attention. As might be expected, such a condition was not generally recognized clinically until hypoglycæmia had been evoked by insulin. The biological fact was known to laboratory workers and had been observed in Addison's disease and pituitary tumour, but it was not appreciated as a symptom-complex. During 1933 two critical reviews of the whole subject appeared, one by G. M. Wauchope,¹ the other by C. Sippe and J. Bostock,² from which the following account has been largely drawn.

Blood-sugar is normally at a lower level in children than in adults, and in adults than in the aged. Taking the normal fasting blood-sugar at 100 mgrm., symptoms of hypoglycæmia begin to appear at about 80 mgrm., they become severe at 50 or 45, and death may occur with a level of about 25 mgrm. The symptoms are protean, but affect the nervous system chiefly; vegetative, bulbo-pontine, cortico-spinal, and thalamic portions may all be affected, and usually in that order. But psychic phenomena, such as terrors and rage in

children, and symptoms resembling acute alcoholism in adults, may occur early. Since caffeine will prevent the symptoms without checking the fall of blood-sugar it appears that there is also an insulin intoxication acting on the nervous tissues. Two other striking symptoms may occur—hunger pain and angina pectoris. Sippe has reported five cases of hypoglycæmic angina, and the reviewer has met with one striking example of an over-dieted diabetic whose anginal attacks entirely ceased on giving him more carbohydrate. With the administration of sugar and the return of the blood-sugar to normal all symptoms swiftly and dramatically disappear; usually when the patient recovers he is perfectly well.

Hypoglycæmia with its attendant train of symptoms is to be regarded in the light of a metabolic disturbance due to many causes, just as is pyrexia. Quite apart from insulin therapy, its spontaneous occurrence is by no means rare. In a large series of cases met with in general practice, Sippe found 0.47 per cent cases of hypoglycæmia as against 0.51 per cent of diabetes. Most of the individuals who developed hypoglycæmia in later life had suffered from acidosis or cyclical vomiting in childhood. Cammidge and Howard have shown that the hypoglycæmic tendency is transmitted as a Mendelian recessive character.

It is known that the ingestion of dextrose excites a reflex secretion of insulin, and M. Labbé with others³ have described a type of hypoglycæmia occurring after food. In such individuals the blood-sugar fell within five to fifteen minutes after taking dextrose, the curve returning to normal within half an hour. Sippe and Bostock have not found migraine so commonly associated with hypoglycæmia as Cammidge did, but the reviewer has been much struck with the relief frequently afforded in migraine by dextrose. Incomplete fat metabolism in childhood may excite a relative hypoglycæmia because of the increased need for easily assimilable carbohydrate in order to oxidize the fats. Thus again are cyclical vomiting and hypoglycæmia correlated.

Wauchope classifies the causes of hypoglycæmia thus: (1) *Excess of insulin* from therapeutic injections, tumours or hyperplasia of the pancreas, or functional hyperinsulinism; (2) *Lack of opposing secretion*—disease of the adrenals, pituitary tumours, myxœdema; (3) *Lack of glycogen* from hepatic disease, renal diabetes, lactation, excessive exercise, starvation; (4) *Interference with regulating centre*—pontine disease, overaction of the vagus. The following instances culled from the literature of the year illustrate these conclusions.

Pancreatic Tumours.—W. G. Barnard⁴ reports a fatal case of adenoma of the islets in a woman of 40. R. McD. Cairns and S. E. Tanner⁵ report a case of attacks of mental confusion and unconsciousness in a woman of 52 whose blood-sugar was as low as 0.041 per cent. In spite of intravenous dextrose and pituitrin it fell to 0.029 per cent and the patient died. A pancreatic tumour composed of islet tissue was found. C. L. Derrick and others⁶ report a similar case in a woman of 57, who was however cured by operation. An adenoma of rather large islet cells was removed, and an extract of this tumour was found actively to reduce blood-sugar in a rabbit.

Pancreatic Hypoplasia and Hepatic Disease.—Hal Winans⁷ reports a case of hypoglycæmic convulsions associated with hypoplasia of the pancreas. He refers to a disturbance between the external and internal secretions of the pancreas, but the explanation is not convincing, though in the present state of our knowledge a better one is not forthcoming.

P. J. Cammidge and E. P. Poulton, however, in commenting on a case which W. J. Griffiths and O. L. V. de Wesselow⁸ labelled dysinsulinism, point out that all the biochemical changes are found in rabbits whose livers have been poisoned by phosphorus or hydrazine phosphate. Hepatic deficiency leading

to interference with the glycogenic function of the liver may therefore be a cause of hypoglycæmic attacks, and this origin is further suggested by the fact that in the case under review adrenalin did not raise the blood-sugar. Since it usually does so by drawing on the glycogen stored in the liver, we can understand why this should fail to occur if the liver is sufficiently damaged. Hyperinsulinism is not the sole cause of spontaneous hypoglycæmia.

Lack of Opposing Secretions.—A. S. Petterson⁹ reported a hypoglycæmia of 25 mgrm. in a patient suffering from atrophy of the adrenals and thyroid with enlargement of the pancreas. J. Rabinovitch and F. W. Barden¹⁰ report a case of hypoglycæmia associated with destruction of the adrenal medulla by lymphocytic infiltration. There was also a nodule of chronic pancreatitis, but no neoplasm.

Lack of Glycogen.—S. P. Goodhart and J. Lander¹¹ report two cases of severe nervous symptoms due to spontaneous hypoglycæmia relieved by carefully regulating the carbohydrate intake.

REFERENCES.—¹*Quart. Jour. Med.* 1933, Jan., 117; ²*Med. Jour. of Australia*, 1933, Feb. 18, 208; ³*Presse méd.* 1932, June 4, 885; ⁴*Jour. Pathol. and Bacteriol.* 1932, Nov., 929; ⁵*Brit. Med. Jour.* 1933, i, 8; ⁶*New Eng. Jour. Med.* 1933, Feb. 9, 293; ⁷*Amer. Jour. Med. Sci.* 1933, April, 500; ⁸*Lancet*, 1933, i, 519; ⁹*Acta Med. Scand.* 1928, lxi, 232; ¹⁰*Amer. Jour. Med. Sci.* 1932, Oct., 494; ¹¹*Med. Jour. and Record*, 1932, Oct. 19, 809.

HYPOTHYROIDISM. (See THYROID.)

ICHTHYOSIS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

A. Cedercrutz¹ claims considerable success in treating cases of ichthyosis with **Magnesia**, both internally and externally. His attention was called to this treatment by a cure reported by Lacassagne, Liegois, and Friess of a man, aged 22, with keratosis palmare et plantare. This patient was given 0.4 grm. of calcined magnesia daily by the mouth, and after three weeks' treatment the hands appeared to be normal; there was no return of the trouble during a month without treatment. Later Carle reported a similar case with equally good results, but he combined a magnesia ointment with internal treatment. Cedercrutz has treated five cases of ichthyosis serpentina, two severe and three mild cases, with from 0.1 to 0.2 grm. calcined magnesia daily by the mouth, combined with the application of 10 to 30 per cent magnesia in vaseline externally. The results obtained have been very striking.

REFERENCE.—¹*Munch. med. Woch.* 1933, Jan. 27, 149.

ILEUS. (See DUODENAL ILEUS; INTESTINES, SURGICAL DISEASES OF.)

IMPETIGO CONTAGIOSA. (See SKIN, PYOGENIC INFECTIONS OF.)

INDUSTRIAL POISONING. (See TOXICOLOGY.)

INFANCY, DISEASES OF. (See ANÆMIA IN CHILDHOOD; DIARRHŒA AND VOMITING IN INFANTS; NEWBORN, DISEASES OF; PREMATURE INFANTS.)

INFANTS, PREMATURE. (See PREMATURE INFANTS.)

INFANTS, TRANSFUSION OF BLOOD IN. (See BLOOD TRANSFUSION.)

INFLUENZA.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to the Report issued by the Health Section of the League of Nations the influenza epidemic of the winter 1932-3 commenced in the United States in the beginning of December, swept the country from west to east, and reached its peak in the Eastern States during the second

week in January. In the middle of December the epidemic began to appear in the northern towns of England, spreading towards the south and east, and reaching its height in London in the first week in February. On the continent of Europe the incidence of the disease was only severe in Germany, France, Switzerland, and Spain, but the general death-rate was not greatly affected in any country but in England, in which the epidemic was one of the most widespread observed since 1919 and was as serious as those of 1922 and 1927. On the whole the epidemic of 1932-3, though more important than those of the two previous winters, was not so severe as that of the winter of 1928-9 (see MEDICAL ANNUAL, 1930, p. 289). On the other hand, in England and Germany it was more serious than the epidemic of the winter of 1926-7 (*Ibid.*, 1928, p. 237).

N. J. Burden² gives the following description of the epidemiological characteristics of influenza: great explosiveness of the disease, rapid increase in the number of cases reaching a peak in two or three weeks and gradually fading in the same length of time; rapidity with which the disease spreads from place to place; high morbidity with low mortality; independence of weather and season; increased death-rate among young adults; and recurrence of epidemics. Localized attacks of an acute febrile disease resembling epidemic influenza occur every year during the winter, and are probably due to a milder strain of the influenza virus than that which causes the epidemic type. Burden reports a typical outbreak of this seasonal influenza which affected 140 students aged from 17 to 27, and resembled epidemic influenza in its explosiveness and dispersiveness, high incidence among young adults, sudden onset and short duration, general symptoms, leucopenia, and the frequency of atypical bronchopneumonia as a complication.

BACTERIOLOGY.—Wilson Smith, C. H. Andrewes, and P. P. Laidlaw³, of the National Institute for Medical Research, after unsuccessful attempts to infect many different species of laboratory animals, succeeded in transmitting the disease to *ferrets*. Throat washings obtained from influenza patients as early as possible after the onset of definite symptoms were filtered through a membrane impermeable to bacteria, and the filtrate, which was found to be bacteriologically sterile, was inoculated into ferrets both subcutaneously and by nasal instillation. Three days after infection the animals developed nasal catarrh and fever, and various systemic disturbances which subsided in a few days. The disease was frequently transmitted by placing a normal ferret in the same cage as a sick one for twenty-four hours. Throat washings from four human subjects not suffering from influenza were non-infective, as were also the nasal secretions of a man with a severe common cold. Serum from human convalescents from influenza as well as from ferrets which had recovered from the experimental disease was found in a high percentage of cases to neutralize strong emulsions of the throat washings, whereas normal ferret serum had no such power. The writers also found that the virus of severe influenza described by Shope in 1931 and 1932 caused a disease in ferrets indistinguishable from that produced by virus of human origin. They conclude that epidemic influenza in man is caused primarily by a virus infection, and that in certain cases this infection facilitates the invasion of the body by visible bacteria producing various complications.

SYMPTOMS AND COMPLICATIONS.—W. Needles,⁴ who records an illustrative case, states that while *influenzal meningitis* is by no means an uncommon disease, recovery therefrom is decidedly rare, only 25 examples having hitherto been recorded. The prognosis is better in adults than in children. The general consensus of opinion is that the causal organism is of the same type as that originally described by Pfeiffer. According to Neal and Rivers *influenzal*

meningitis is not at all related to epidemic influenza, as is shown by the fact that during the epidemic of 1918 there was no increase in the number of cases of influenzal meningitis. In a large number of cases influenzal meningitis may exist as a primary disease, as is shown by the fact that of 71 cases which came to autopsy 29 failed to show any source of the infection elsewhere in the body. Needles's patient was a man, aged 29, admitted to hospital with symptoms of meningitis. The Pfeiffer bacillus was cultivated from the cloudy cerebrospinal fluid. Treatment consisted in repeated **Lumbar Punctures**, and recovery took place. A recurrence of the meningeal syndrome occurred a month after his discharge from hospital, but the turbid cerebrospinal fluid on this occasion was sterile, and rapid recovery ensued.

P. A. Heeres and L. Koster³ found that in 68 uncomplicated cases of epidemic influenza the *sedimentation rate* was normal. Scarcity of eosinophils and a relative lymphocytosis were also fairly constant in uncomplicated cases.

REFERENCES.—¹*Epid. Rep. Health Sect. League of Nat.* 1933, 123; ²*Amer. Jour. Med. Sci.* 1933, cxxxvi, 52; ³*Lancet*, 1933, ii, 66; ⁴*Jour. Amer. Med. Assoc.* 1932, xcix, 1342; ⁵*Nederl. Tijds. v. Geneesk.* 1932, Nov. 12, 5234.

INFRA-RED RAYS AND PERSONAL COMFORT.

G. E. Oates, M.D., M.R.C.P., D.P.H.

Much light has been thrown in recent years on the sensations of discomfort arising in living rooms when overcrowded or artificially heated. It was first pointed out by L. Hill, and it is now universally accepted, that beyond anything else the unpleasant sensations experienced in the so-called vitiated atmosphere of a crowded room are dependent on heat stagnation. The air in contact with the skin and entangled in the interstices of the clothing becomes warmed and saturated with moisture. In order to obtain relief it is necessary to keep down the saturation of the air in contact with the body, and it then becomes possible for the heat-regulating mechanism of the body to function properly. The admission of a stream of air from outside is effective but by no means essential. It may be sufficient merely to agitate the air of the room by means of electric fans.

L. Hill¹ now describes another factor in causing discomfort indoors—that is, the quality of the infra-red rays given off by the means of artificial heating and their effect on the naked parts of the skin. He states that the feeling of dryness and the unpleasant quality of heat is often due to the direct action of irradiation on the skin, stuffiness of the nose due to a reflex congestion of the nasal mucous membranes resulting from the action of the rays on the cutaneous nerves. This reflex effect is pronounced in some persons with a deflected septum or with a chronic catarrhal and congested state of the nose. It can be made evident to most of those who have widely open noses by means of a screw nose-clip, adjusted to narrow the air-way until the breathing is only just adequate in cool air, for example, by an open window. Exposure of the face to a dull red or dark source of heat then makes the breathing difficult, while screening at once gives relief. Cool air from an open window or fan antagonizes this 'nose-closing' effect. Cooling of the irradiated skin by the approximation of a cold surface likewise stops the reflex; so does wetting the skin with water. The reflex is not provoked from the skin when this is wet with sweat.

Most remarkable is the fact that the nose-closing reflex set up by a blackened radiator or a dull red electric fire is antagonized by the shorter infra-red rays from an incandescent source such as a hot coal fire, an incandescent gas or electric burner, or a glowing modern gas fire fitted with 'beam' radiants. In order to demonstrate this it is sufficient to stand in front of a dull red

electric fire, when nasal congestion and a prickling, burning sensation from the heat on the face will probably be felt. Immediate relief is experienced on bringing an electric lamp on a flex close to the face, although the actual amount of energy falling on the skin is increased. The custom of putting a trough of water in front of a stove or old-fashioned gas fire now receives a scientific explanation. The trough does not humidify the air of the room to any extent, but it produces a screen of aqueous vapour sufficient to lessen the nose-closing heat rays and remove their nose-closing effect. The trough acts only so long as it lies between the fire and the skin; if put to one side it is useless.

The most valuable conclusion to be drawn from these researches is that air, preferably cool air from outside, should circulate through rooms where there are sources of dull red or dark heat. It is also important that the heating elements of gas or electric fires should be brightly incandescent.

REFERENCE.—*Brit. Med. Jour.* 1933, i, 1096.

INJURY AND NERVOUS DISEASE.

Macdonald Critchley, M.D., F.R.C.P.

The relationship of trauma to nervous or mental disease constitutes to-day one of the commonest problems in practice. Medico-legal work demonstrates the frequent association in time between injury and the development of nervous disease; the law goes further and presses the reluctant practitioner for his opinion on the precise etiological relationship. Fraudulent or exaggerated histories; imperfect recollections; the bias of chagrin, resentment, and sense of injustice; and suggestion at the hands of relatives or advisers doubtless rule out a number of cases where close relationship between injury and nerve disease appears to exist. Perhaps this is especially true in compensation cases or where the responsibility for the accident may be laid to the charge of negligence. There remains, however, a considerable number of cases where trauma—including injuries sustained at games or sport—has been followed closely and unquestionably by the initial symptoms of a severe and often progressive nervous disorder. The injury itself is very variable in nature. It need not necessarily be severe, as evidenced by wartime experience, and indeed it is often relatively trivial. In perhaps the majority of cases the central nervous system is directly attacked by way of injuries of the head or spinal column. Concussion has occurred in a large number of cases. Less frequently the limbs and trunk are the seat of injury. Penetrating flesh wounds are not common, and a history of bony fracture is frequently unobtainable. In addition to the effects of direct physical violence, the rôle of electrical shock must be realized as an increasingly common cause of nervous invalidism. Much rarer accidents include temporary asphyxiation from gassing and partial drowning or hanging, lightning-stroke, exposure to extremes of heat or cold, abrupt changes in altitude, in aerial descents, and sudden alterations in atmospheric pressure. The attitude of the profession towards such cases is widely divergent. In attempting to clarify the problem somewhat, one may divide the clinical material into certain groups depending upon our present conceptions as to etiology.

1. We may first recognize those cases where nervous disease has been the direct effect of nerve injury, and where trauma is the sole etiological factor recognizable. Here belong the cranial nerve palsies after fracture of the skull, the hemiplegias from gross cerebral destruction, the 'post-concussional syndromes', and the post-traumatic psychoses. Many cases of epilepsy belong here. One may also include the special nerve complications of electrical injuries (spinal atrophic palsies, electro-traumatic encephalo-myeloses) as well as the keraunoparalysis which follows lightning (M. Critchley¹).

2. In a separate group are placed neurological disorders of known causation which have clinically dated from the accident. This class includes those cases of cerebral and spinal tumour, tabes dorsalis, and general paralysis of the insane where symptoms have closely followed the time of the accident. Although trauma cannot be regarded as the sole and direct cause of the symptoms in such cases, since the nature of the disorder—neoplastic or spirochaetal—is known, it must be remembered that every detail of etiology is not yet necessarily understood.

3. Recognized neurological affections, of unknown nature or causation, may at times appear and develop shortly after the accident. Here belong cases of progressive muscular atrophy and amyotrophic lateral sclerosis which follow trauma not infrequently, commencing in the injured segment of the body in a manner foreign to the 'typical' idiopathic varieties. Cases of disseminated sclerosis may also be included here, although the disease is usually regarded as an infective one, on evidence which is not altogether convincing.

4. Lastly we may group syndromes of diverse causation, among which trauma may occasionally be demonstrable. Chorea following injury may be cited here. The interesting cases of post-traumatic Parkinsonism, described in greater detail in the MEDICAL ANNUAL for 1932 (p. 348), may also be included.

W. Harris² in a Savill Oration has re-opened this important question of trauma and nervous disease. He quotes a series of cases from his own practice where organic neurological affections have appeared shortly after injury. Most of his cases would belong to the second and third groups mentioned above. The author is of opinion that trauma is at times a very important precipitating factor in nerve disease, even when the causative process is understood (e.g., *Spirochaeta pallida*, neoplasia). Whether symptoms would have arisen later in the absence of accident it is of course impossible to affirm, and equally impossible to deny. When nervous disease of obscure nature and pathology develops after injury (e.g., progressive muscular atrophy), the trauma at least cannot be excluded as a factor, since the etiology is completely unknown. Harris's expression of opinion may be quoted verbatim:—

"Until we know more and have accurate knowledge of the pathological processes underlying such diseases as progressive muscular atrophy and disseminated sclerosis, we have no right to deny the etiological factor of trauma when the history of the case shows a close time relation between the injury and the onset of the symptoms. . . . My own view is that when symptoms develop directly after an injury in a previously healthy individual we have no right whatever to assume that the injury has no causal connection with the development of the disease. In such case we should be assuming a supernatural knowledge, which is not yet vouchsafed even to the writers of articles in text-books."

REFERENCES.—¹*Bristol Med.-Chir. Jour.* 1932, xlix, 285; ²*Brit. Med. Jour.* 1933, Nov. 25.

INSANITY. (See also MENTAL DISORDERS; PSYCHOTHERAPY.)

INSANITY, SUDDEN.

H. Devine, M.D., F.R.C.P.

E. Miller¹ points out that the subject of sudden insanity or acute psychosis is of importance to general medicine because its causes have their roots not only in the psychology of the patient but not infrequently in some disturbance of a general character, toxic-infective or metabolic. Owing to the sudden nature of the onset compared with the insidious occurrence of the average mental disorder, the question of diagnosis is rendered difficult because of complicated etiology in all cases, even where precipitating factors may soon be made clear.

Acute Psychoses caused by Infective Conditions.—In some cases of sudden psychoses the causal factor may be a toxic-infective condition, the nature of which calls for immediate localization. There has been a growing appreciation that mental disorders, acute and chronic, may be occasioned by septic foci in different parts of the body, which produce toxins or direct infective spread to nervous tissues. Septic foci in the teeth and alveoli, suppuration in the maxillary antrum, the ethmoid, and sphenoidal sinuses have been discovered in many chronic mental disorders. A chronic appendix, intestinal stasis, and uterine infections have all been found from time to time in cases of manic-depressive and schizophrenic psychoses. There are times, however, when these chronic infections produce not only slowly developing mental changes but sudden disorders of the mental life. In considering such cases of sudden onset, the physician must look not necessarily for a sudden infective condition, but for some long-standing disorder. Thus a chronic focus of infection may be responsible for a sudden and acute psychosis. In some cases of acute disorders of the body, infective and metabolic, a sudden and severe psychosis may develop, the physical causation of which may be overlooked. The diagnosis may appear to be that of a psychological disorder, and several days may elapse before the causal physical disturbance shows itself, either by classical physical signs or as a result of clinical, pathological, and biochemical investigations. The writer cites the following cases which illustrate this: A man who had enjoyed perfect health suddenly began to express delusory ideas which rapidly passed on to acute delirious mania. He had an anxious expression, developed fantastic ideas of a religio-persecutory kind, and had to be restrained from injuring himself and others. Subsequently his temperature rose and the characteristic signs of lobar pneumonia appeared. In another case, a woman, aged 54, developed ideas of persecution which rapidly passed on to a rambling delirium. For about a week before these symptoms manifested themselves it had been noticed that she was strange in her behaviour. She began to collect rubbish and hide oddments under her bed. Subsequently cystoscopic investigation with catheterization of the ureter revealed a pelvic infection to which the patient succumbed within a week. In a third case an acute psychosis was found to be due to the omission of a patient, the subject of diabetes, to take his meal after giving himself his usual dose of insulin.

A large number of acute psychoses are stimulated by acute infections. During the influenza epidemic of 1918-19 there were not only the fulminating infections largely pneumonic in character, but many victims who presented acute psychotic symptoms. These psychotic symptoms presented the pictures of all the typical forms of insanity—from sudden persecutory and homicidal mania to catatonic forms of dementia præcox. It was easy in those days to define the causal agent in the current of influenza of the time, and when influenza epidemics occur it is equally not difficult to place the blame for a sudden insanity upon the broad shoulders of influenza. The post-influenzal depressions, sometimes of short, sometimes of long duration, belong to this group, and the diagnosis should be influenza rather than psychosis except in those cases in which the acute infection has disappeared and nothing but mental disorder remains, as it were, in its own right. Apart, however, from epidemics, the sporadic occurrence of this infection must not be overlooked in searching for causes of sudden insanity.

Acute Psychogenetic Psychoses.—Miller points out that a large group of cases of sudden mental aberration sufficiently severe to be classed as insanities occur as the result of some change in mental attitude occasioned by a psychological or, more precisely, emotional distress. Many young people who in

adolescence more or less suddenly present mental disorder are suffering from the difficulties of adolescence which are produced by the new forces which well up as a result of sexual maturation. The new balance of the endocrine glands, which must be assumed to take place at puberty, is not arrived at with equal suavity by all young people. Those who are of a sensitive nature or who have stored up in the mind mental conflicts, and who have in addition some abnormality of the sympathetic system, are the candidates for mental disorder when some psychical shock occurs which in the more healthy type is quite inadequate to produce disaster. Failure at an examination, loss of a beloved parent or friend, an unsatisfied or sometimes purely fantastic love episode, may precipitate a sudden psychosis.

Sudden and purely psychological crises of the same character will occur at nodal points in the life of people after adolescence. Cases of sudden manic-depressive psychosis or schizophrenia may supervene on the eve of marriage, and not infrequent cases of pre-nuptial suicide must be regarded as complete failure to stand up to the new responsibilities which marriage entails. But such sudden mal-adaptions must be grown upon abnormal soil, in which the seeds of mental disorder can be unearthed on careful anamnesis. Sometimes the birth of a child to a woman, or the sudden responsibility of paternity in a man, may precipitate sudden psychosis.

PROGNOSIS.—As regards the prognosis in these sudden psychoses: (1) In the toxic-infective group it will depend upon the degree of invasion and intoxication and the accessibility of the cause to medical and surgical attack; (2) In the purely psychological cases it will depend upon the degree of constitutional and hereditary handicap, and the ability the patient has either to face a subsequent psychological analysis, or a change of environment away from the cause of stress and in conformity with his personality.

REFERENCE.—¹*Practitioner*, 1933, March, 316.

INSOMNIA AND THE USE OF HYPNOTIC DRUGS.

Bernard Hart, M.D., F.R.C.P.

It has long been a commonplace that the treatment of insomnia does not merely consist in the selection of appropriate drugs, but this precept is still frequently honoured rather in the breach than the observance, and its fundamental truth and importance cannot be too much emphasized. Insomnia is clearly a symptom in whose causation many diverse factors may play a part, and efficient treatment must necessarily depend upon the ascertaining and removal of the factors existing in each individual case. The conclusion might be drawn from this principle that no scientifically conceived therapy is possible until we have a reasonably clear knowledge of the actual mechanism of sleep, and that so long as that mechanism is the subject of divergent and very unproven hypotheses, only a purely empirical and unsatisfactory treatment is possible. Such a conclusion would not be correct, however, because of a peculiar circumstance which attaches to the causation of insomnia, and which makes its efficient treatment practicable in spite of our ignorance of the machinery of sleep.

Whatever the nature of this machinery may actually be, it is a fairly accurate generalization to say that it is rarely directly affected. In the great majority of cases of insomnia the causes are merely obstructive causes, and the mechanism can be relied upon to come into action if those obstructions are removed. Hence the primary aim of treatment must be removal of obstacles, and fortunately we already have a sufficient knowledge of their nature to make therapy both practicable and intelligible.

Starting from this point of view, the treatment of insomnia would consist in negative and positive methods, the former designed to remove obstructive causes, and the latter either directly to produce sleep, or to counteract obstructive causes which it would obviously have been better to remove if possible. By far the most important positive method available is the use of hypnotic drugs, and their potency and value are beyond question.

These considerations serve to place the employment of hypnotic drugs in proper perspective. The causes of insomnia are mainly obstructive, and hence the chief aim of treatment must be to remove the obstructions. Drugs are generally to be used only as an accessory aid to this chief aim, or in final resort as an inferior substitute for removal if, owing to our diagnostic or therapeutic impotence, such removal is impracticable. No doubt there are certain states in which the sleep mechanism itself is directly affected by disease, as may be the case in some organic cerebral conditions for example, but such instances form only a small minority of the whole, and the above principles constitute a safe practical guide in the great majority of cases.

The obstructive causes of insomnia are of many kinds, but the greater number tend to converge to a single obstacle, the presence of a state of mental or physical unrest hostile to that equanimity which seems to be the most essential antecedent condition of sleep. Bearing this in mind, we may now proceed to review briefly the factors producing insomnia, and the indications for treatment which arise therefrom. It will be convenient to divide these factors into physical and psychological.

PHYSICAL DISEASES.

The most important factor here is *pain*, which, whatever its origin, may act as a potent obstructive cause of insomnia. Treatment resolves itself into allaying the pain, and this must be achieved either by dealing directly with the primary disease responsible for it, or by the use of **Analgesic Drugs**, particularly, of course, **Opium** and its derivatives.

Various factors other than pain may interfere with sleep in the course of physical disease, such as *dyspnœa* and *cough*. In all such cases treatment is primarily aimed at the removal of the disturbing factor, but hypnotic drugs have also frequently to be employed. Both here, and in insomnia arising from pain, selection of the drug must be carefully made and with due reference to possible adverse effects upon the primary disease processes—for example, the depressant action of morphine upon the respiratory centre in certain cases of pulmonary disease.

Finally, in several conditions the physical disease may produce insomnia, not merely by obstructing normal sleep, but by direct action on the mechanism of sleep itself. This may occur in *organic brain disease*, and perhaps in *vascular hypertonus*.

PSYCHOLOGICAL CAUSES.

The psychoneuroses form the chief group of cases in which causes of this character play a dominant part, but such causes occur in many other conditions, and it may be said that psychogenic insomnias exceed all others in frequency and importance. The factors concerned may be of many different kinds, but the following are perhaps the most common.

In the first place we have *states of anxiety and pre-occupation*, which destroy the mental equanimity generally required before the sleep process can come into action. Such states may arise in the course of various psychoneurotic disorders, the anxiety being due to conscious or unconscious mental conflicts,

or they may be due to worries and stresses associated with everyday life. Whatever its origin, the first necessity of treatment is to reduce the anxiety—a process which may perhaps require an elaborate psychotherapy, but which may often be satisfactorily achieved by simple measures such as discussing with the patient the source of the mental unrest, getting it into better perspective, and arriving at some means of dealing with the disturbing situation.

There is one form of pre-occupation which is a potent cause of insomnia, and that is pre-occupation with the function of sleep itself. The patient is fearful lest lack of sleep should produce some disastrous result, particularly insanity, and he goes to bed with his mind anxiously concentrated on the paramount necessity of achieving sleep—a state which is peculiarly liable to perpetuate insomnia. For it must be remembered that normal sleep does not arise as a result of will and effort, but by establishing a state of equanimity, and the substitution of diffuse and unsustained thinking for the directive thinking accompanying our daily activities. The endeavour to achieve sleep by will and effort most surely defeats its own object. Simple psychotherapeutic measures are often remarkably effective in dealing with this factor. The patient must be reassured about his fears, and particularly made to understand that there is no risk whatever of the sinister consequences he has envisaged. He should be told that natural sleep will inevitably supervene long before any danger-point is reached, and that the amount of sleep he is actually getting, though doubtless insufficient for comfort, is more than adequate for absolute necessities. This last reassurance will sometimes act like a charm, and immediately result in an excellent night's sleep.

In certain cases more subtle psychological factors may be playing a part. A patient may be afraid to go to sleep because of the frequent occurrence of *terrifying dreams*. Again, insomnia has a place in the long list of *hysterical symptoms* which have an unconscious motivation. It may serve to keep the patient in the centre of the stage, to obtain continuous care and attention from a married partner whose interest is felt to be a desperate need, or to preserve a position of dependence and freedom from the responsibilities of adapting to life. Cases of this kind belong to the psychoneuroses, and require the special investigation and treatment demanded by these conditions.

The last factor which requires mention here is *habit*—a process obviously of great importance in our topic, whether it be conceived as acting through psychological or physiological channels. While habit cannot be a primary cause of insomnia it may play a prominent part in maintaining the condition, and just as it is largely responsible for the fact that we normally go to sleep when we go to bed, so it may be largely responsible for the fact that we do not go to sleep when once the normal sequence has been broken. It is particularly here that positive aids, such as drugs, have to be temporarily employed in order to re-establish the broken sequence.

HYPNOTIC DRUGS.

The number of available hypnotic drugs is very large, and is constantly being increased by the placing on the market of new synthetic preparations, most of which belong to the barbitone group. A detailed and comprehensive description is of course impossible here, but it will be helpful to have a rough classification before us, based partly on chemical and partly on clinical grounds. From this practical point of view, three groups call for special mention. The first includes the bromides and chloral, the second paraldehyde, and the third is the barbitone group, which comprises veronal, medinal, luminal, and a rapidly increasing number of allied preparations.

The Bromides and Chloral.—The value of the bromides in the treatment of insomnia is a matter of dispute, but much of this divergence of opinion is due to a failure to discriminate between cases which are suitable for their employment and cases which are not. In the insomnia of acute mental disorder, for example, they are almost entirely useless, but in cases where a mild sedative is required to damp down a constant nervous restlessness which inhibits sleep they may fulfil this aim very satisfactorily. Combined with chloral they have a much greater potency and applicability, and such a combination is useful even in psychotic insomnias so long as no marked degree of excitement exists.

Paraldehyde is a most valuable drug. It is effective and reliable, and it is rapid in its action, sleep often being produced within a few minutes. It has no depressing effect on circulation or respiration, and a paraldehyde habit, though known, is of very rare occurrence. Almost its only defects are its unpleasant taste and odour; these cannot be effectively concealed by prescribing flavouring agents, and they are irritatingly prolonged by the fact that paraldehyde is excreted by the breath. Further, its action is short-lived, and it is hence useless in cases where prolongation of sleep rather than speedy induction is required.

Barbitone Group.—The best-known members of this group are **Veronal** and **Medinal**, both of which, although less rapid in action than paraldehyde, produce a more prolonged effect.

Amongst hypnotic drugs not belonging to the above groups mention may be made of **Sulphonal**, which, although undoubtedly useful, requires special care in administration; and **Hyoscine**, which is rarely to be recommended except for emergency use in psychiatric practice. **Opium** and **Morphine** should only be employed where insomnia is due to pain, and then only with special precautions.

Dangers of Hypnotic Drugs.—There is considerable diversity of opinion as to the dangers attending the use of these drugs, particularly those belonging to the barbitone group. It is alleged, on the one hand, that they may produce toxic effects of a serious character, and that they tend to the formation of habits, so that patients become increasingly dependent upon them. On the other hand, it is held that neither of these defects constitutes a grave risk, and that hypnotics can be continued over long periods with impunity. The truth probably lies between these extreme positions. Toxic effects can certainly be produced by prolonged administration of barbitone drugs, unless they are used with suitable precautions, because if excretory processes are defective they may accumulate and hence lead to serious results. Again, habit-formation may undoubtedly occur, but such a misfortune can generally be guarded against by insisting on proper safeguards, particularly by withholding from the patient all knowledge of the name and dose of the drug he is taking, and ensuring that it is given under continuous medical supervision in the manner described below.

The widespread fear that the use of 'drugs' for insomnia may lead to an ineradicable habit often introduces a very real difficulty in treatment. The patient will sometimes fight strenuously to do without the drug, and attach to it the same kind of apprehension which he has developed about the expected effects of loss of sleep. He feels that he is between Scylla and Charybdis, and a state of anxiety arises which is likely to render nugatory all attempts at treatment. It is therefore very necessary, whenever the employment of a hypnotic has been decided upon, that the patient should be reassured about his fears.

GENERAL PRINCIPLES OF TREATMENT.

In the light of the considerations which have been adduced above it is evident that the first step in any individual case is to form an opinion as to the factors which are responsible for the insomnia. If it is decided that these factors are mainly psychological, appropriate treatment must be devised. The source of anxiety must be traced, and measures taken to relieve it. This may merely necessitate a commonsense discussion of the internal and external difficulties confronting the patient, particular attention being paid to those preoccupations centred round the feared effects of insomnia, whose importance and treatment have already been described. When the insomnia is one aspect of a developed psychoneurosis, more elaborate psychological investigation and treatment may be required, and the line of attack must be that appropriate to the particular disorder present.

In cases such as these, where the main causes of the insomnia lie in obstructive psychological factors, treatment should clearly consist essentially in the removal of those factors. To shirk this necessary task, and to bludgeon the patient into sleep by the use of drugs without attempting to deal with the primary causes, is a method of treatment at once clumsy and pernicious. This does not mean, however, that drugs should not be employed in insomnias of undoubtedly psychogenic origin. On the contrary they may be helpful, and sometimes indispensable, provided that they are regarded as secondary agents. In psychogenic cases there are two conditions in particular which call for the use of drugs. The anxiety state may be so marked, and so greatly increased by the persistent insomnia, that it is impracticable to proceed with psychotherapeutic measures unless sleep and some degree of resultant tranquillity are first obtained. Here a preliminary course of hypnotic drugs is often essential. Secondly, the factor of habit may have attained such a sway that removal of psychological obstructions is not sufficient, and direct measures to break the habit must be instituted. Here again drugs are temporarily required, carefully administered with a view to re-establishing the habit of sleep. It may be added that, in the insomnia so common in acute mental disorder, psychotherapy is generally inapplicable, and drugs must of necessity be employed.

If the primary cause of the insomnia is not psychological, but due to a physical disease giving rise to pain, dyspnoea, or other sleep-inhibiting process, treatment must of course be directed to the removal of these conditions by appropriate means. Direct induction of sleep by hypnotic drugs is often required, and opium and its derivatives may be of the greatest value. It is to be noted that the use of these latter preparations should as a general rule be exclusively limited to the group now under consideration.

When the use of any hypnotic drug has been decided upon, there are certain principles which should govern its selection and mode of administration. These are based upon a number of considerations, both physiological and psychological. In the first place the drugs available differ in their speed of action, duration of their effect, and suitability for various ages and physical states. All these properties must be taken into account in the selection of an appropriate drug. It is, for example, useless to prescribe a drug with a rapid action but with limited duration of effect, such as paraldehyde, in cases where the patient fails to sleep naturally but tends to wake after two or three hours. In the second place, various psychological factors have to be constantly borne in mind. The onset of sleep is greatly influenced by suggestion. If, for example, the patient knows that he is taking a drug, this knowledge will of itself help to bring about sleep. Correspondingly, if he knows that the drug

he has been taking is now to be discontinued or reduced in dose, he will be fearful of a bad night, and the anticipation will itself produce the dreaded result. Finally, we have to take account of the possible danger of habit-formation.

In view of these various points it is recommended that the patient should never know either the name or dose of the drug he is taking, and that it should be administered in a form, e.g., a cachet, which will permit of the dose being varied without his knowledge. The cachet should be given every night as a routine, and not left for the patient to take if he cannot sleep, as this latter method will frequently produce states of anxiety and preoccupation fatal to the onset of sleep. It is better to commence with a dose sufficiently large to produce sleep with reasonable certainty, as failure at this stage will introduce unfavourable psychological factors. When satisfactory sleep appears to be established, a reduction in dose may be cautiously tried, of course unknown to the patient, but the reduction should be made irregularly, so that on any particular night the patient may be getting actually more than on the preceding night, although the trend is generally downwards.

Finally, it is usually advisable to vary the drug from time to time when prolonged administration proves to be necessary, and two drugs differing in their speed of action and duration of effect are often better than one. Crichton Miller,¹ for example, recommends that two hours before sleep is required a cachet should be given containing luminal and sugar of milk, and just before the normal time of sleep a draught containing Liq. Bromo-Chlor. Co. with Ext. Glycyrrhiz. Liq. The contents of both the cachet and draught can be manipulated in the manner described. For further details the reader is referred to Miller's book, and also to Gillespie's monograph,² in which the problem of insomnia is fully considered in its various aspects.

REFERENCES.—¹*Insomnia*, 1930, London, Arnold; ²*Sleep and the Treatment of its Disorders*, 1929, London, Ballière, Tindall & Cox.

INSURANCE PRACTICE. (See NATIONAL HEALTH INSURANCE PRACTICE.)

INTESTINAL DRAINAGE IN CASES OF OBSTRUCTION.

Sir W. I. de C. Wheeler, F.R.C.S.I.

In an address on the significance of recoil following visceral decompression, the reviewer¹ pointed out that when an organ or system is suffering directly from pressure effects or indirectly from back pressure, the greater the pressure, the more gradual should be its relief. This applies to the distended small intestines in cases of acute obstruction. The sudden relief of the distended abdomen and the collapse of the intestinal walls, together with the flooding of the vascular channels and the fall in blood-pressure, not only increase the absorption of the remaining toxic products but also produce a rapid fall in blood-pressure and general shock. After the introduction of the enterostomy tube, the reviewer has obtained the best results by only permitting a few drachms of intestinal contents to escape every couple of hours for the first twelve hours. Either a screw clamp is put on the tube so that the contents escape drop by drop or a spigot is used as a cork. The spigot is removed every couple of hours and a small amount allowed to escape until the patient's condition is considerably improved. Free drainage is then permitted.

In acute cases the mortality is still notoriously high, and the cause of death has given rise to much research and interesting speculation. Wilkie mentioned, among other fatal factors, splanchnic paresis and draining of the body fluids into the portal area, followed by cerebral anæmia, and toxæmia from the absorption of poisonous products from the upper bowel. Reasoning by analogy,

the former would follow too rapid decompression; the latter would be aggravated by back-pressure.

Looking in retrospect over a number of years, especially since the advantages of high jejunostomy have been realized, it is felt that acute cases did best when a slow steady drain of intestinal contents could be established through a small tube. The worst cases were those in which drainage failed, but often equal post-operative anxiety was felt when the distended intestines were emptied as completely as possible at the time of operation by the use of a large tube. In like manner rapid drainage through a Paul's tube following operation, although often regarded as an encouraging omen, may be followed by deplorable results.

In a case where a band is divided, or an obstruction can be relieved otherwise with simplicity and the intestinal contents gradually evacuated *per vias naturales*, the results are uniformly good. If a small enterostomy tube which does not divert the entire flow, but acts in the nature of a safety valve, is inserted in the more advanced of the simple cases, the results are equally good. (The insertion of this tube is indeed essential in all but the earliest cases.)

The recoil after the sudden relief of acute intestinal obstruction is of a complex nature. The causes of death following operation need further elucidation.

REFERENCE.—¹*Canad. Med. Assoc. Jour.* 1931, xxiv, 3.

INTESTINAL OCCLUSION, CONGENITAL.

John Fraser, Ch.M., F.R.C.S.Ed.

Congenital intestinal occlusion is discussed by G. K. Smith,¹ and it is an indication of the seriousness of the error that, though laparotomy was performed in each case as soon as symptoms were evident (within thirty-six hours of birth), a fatal result ensued. Five cases, all male children, form the basis of the record; two were examples of complete duodenal atresia, while the remaining three were examples of partial stenosis in the ileocaecal region.

Many hypotheses have been advanced in explanation of the error; according to Tandler it depends upon an imperfect canalization of the intestinal epithelium, while Bland-Sutton holds that it is due to imperfect union of gut segments, and Davis and Poynton ascribe the error to a primary vascular sclerosis. Other explanations offered are foetal peritonitis causing bands and adhesions, foetal intussusception, hypertrophy of the valvulae conniventes, volvulus at an early stage of intestinal development, and congenital syphilis. Recent experimental work supports the truth of Tandler's view that the error arises as a result of imperfect canalization of the epithelium which at one stage of development fills the lumen of the gut. The author of the paper under review believes that the error arises from a disturbance of the neuromuscular balance.

From the practical standpoint one of the most interesting features of the paper is the author's recommendation that when cases of this type are operated upon, not only should anastomosis be completed, but the contracted segment of gut should be dilated by some mechanical means.

REFERENCE.—¹*Med. Jour. of Australia*, 1932, Dec. 3, 685.

INTESTINES, SURGICAL DISEASES OF. (See also COLON, SURGERY OF; DUODENAL ILEUS; INTESTINAL OCCLUSION, CONGENITAL; MECKEL'S DIVERTICULUM.)

A. Rendle Short, M.D., F.R.C.S.

Diagnosis of Intestinal Obstruction.—A really valuable method of diagnosis has been introduced of late years, and has already been noticed in the MEDICAL ANNUAL. If a patient with acute intestinal obstruction is examined with the X rays, the patterns of gaseous distension and of horizontal fluid levels

give information which we have several times found reliable in otherwise doubtful cases. A paper appears on the subject by L. Ginzburg,¹ of New York. No barium should be given; the author has seen three cases in which it precipitated acute obstruction. The patient is examined recumbent for the gas-pattern, and standing for the horizontal fluid levels. If the small intestine is gas-filled and shows fluid-levels, and the colon is not gas-filled, the obstruction is at or above the cæcum. If part of the colon is gas-distended and contains fluid-levels, the obstruction is lower down. Post-operative paralytic ileus gives a picture which cannot be distinguished from mechanical obstruction. We agree, however, with H. J. Paterson² that this method should not be used if the diagnosis is obvious on clinical grounds. A debate took place at the British Medical Association Meeting in July, 1932, at which Sir Henry Newland,³ of Adelaide, emphasized the importance in diagnosis of giving *two* enemata. The first may bring away faeces, the second, if obstruction is present, brings away neither faeces nor flatus, and there is no relief of the pain and vomiting. A. H. Burgess⁴ called attention to the value of abdominal auscultation, which is too much neglected. Many years ago Greig Smith used to contrast the loud gurgling and explosions of obstruction with the 'deathly silence' of peritonitis.

Treatment of Post-operative Paralytic Ileus.—On the same occasion Sir Wm. Wheeler⁵ described his scheme of treatment for paralytic ileus. He says:

"Few will recommend reopening the abdomen within the first twelve hours unless the condition at the time of the recent operation was such as to suggest the likelihood of mechanical post-operative obstruction. The next twelve hours is marked by therapeutic inactivity. Vomiting prevents the patient taking anything by the mouth, and previous stimulating enemata have made the rectum intolerant. The patient should be given rest. Beneficent quietude is promoted by aspiration of the stomach through a Jutte tube, which may be left *in situ*; no liquid paraffin or other aperient should be introduced. If the pulse-rate has not gone up, and if the tongue remains moist and the material aspirated from the stomach is still bile and mucus, there is a likelihood that an enema at the end of twenty-four hours will be followed by the passage of flatus and intestinal contents. It is taken for granted that during the period of anxiety—that is, from the time of the failure of the first aperient and enemata—fluids are generously administered. **Normal Saline** is introduced by the drip method into one axilla from a flask above the head of the bed. It is absorbed as rapidly as it is introduced. Intravenous injections of 10 per cent **Glucose** solutions are given slowly every four hours. When the introduction of the needle is found difficult owing to badly defined veins, it is better to introduce a cannula and allow the solution to drip by the continuous method into the selected vein. Continuous intravenous medication is an immense advantage in selected cases.

"But if, after the second twelve hours, an enema of turpentine, ammonia, or ox bile is ineffectual, immediate operation must be considered. While preparations are being made one or more intravenous injections of hypertonic salt solution are given slowly; 500 c.c. of a 6 per cent solution is an average quantity and strength, although the strength may be increased to 20 per cent. The replacement of the depleted chlorides in the blood sometimes has a dramatic effect in producing intestinal peristalsis and in combating the toxæmia associated with alkalosis. A copious bowel action may take place during the injection when there is no insuperable barrier to the intestinal onflow."

He also quotes C. H. Mayo as saying that in such cases he would prefer to see a stomach tube hanging round the neck of his surgical intern rather than a stethoscope!

Writing on the same subject, Nichol Smith,⁶ of Los Angeles, declares that jejunostomy and gastric lavage have given place now to the **Indwelling Duodenal Tube**, connected with some form of suction apparatus, which quickly relieves the nausea and vomiting. He also gives a **Bacteriophage** intraperitoneally. D. Cheever⁷ is in favour of opening the abdomen, delivering the coils of small intestine outside, introducing a tube therein, and milking out the whole contents of the bowel to eliminate toxins. [This is an old treatment revived which most of us have abandoned as causing too much shock.—A. R. S.]

P. C. Potter and R. S. Mueller,⁸ of New York, write to the effect that post-operative distension can be prevented by injecting six doses of one ampoule each of **Pituitrin** at four-hourly intervals, starting just before the operation if under a general anæsthetic, and just after if spinal anæsthesia is used. There was no increased peristalsis, and in 200 cases no untoward symptoms were produced. P. Caffier,⁹ of Berlin, reports favourably on a urethane derivative called **Prostigmin**, which acts on the bowel like physostigmine. It is a Hoffmann-La-Roche preparation.

Treatment of Acute (Mechanical) Intestinal Obstruction.—At the B.M.A. discussion, A. H. Burgess⁴ emphasized the importance of knowing before opening the abdomen whether the block is in the small gut or the large; here X rays are very useful. In late cases, already much distended and toxic, he again advocates blind **Cæcostomy** under a local anæsthetic, if the block is in the large intestine. Blind enterostomy for small intestine block is not to be advised; the risk of leaving strangulated small gut in such cases is 60 per cent, whereas the risk of leaving strangulated colon is only 1·5 per cent. D. P. D. Wilkie¹⁰ reminded the audience of the need for pre-operative treatment, lavage of the stomach, and hypertonic saline intravenously. He and Burgess agree that spinal anæsthesia is safest, and if there is gangrenous gut he thinks well of **Anti-gas-gangrene Serum**.

Statistics.—R. M. Vick¹¹ presents a report on 6892 cases treated at 21 hospitals (12 London, 8 provincial, 1 Scottish) during the years 1925–30 (*Table I*).

This table gives a detailed analysis of the various types of acute intestinal obstruction under the main headings and the sub-headings. It shows the age incidence of acute obstruction of each type in the first set of columns. In the second set it gives the site of the obstruction; in the third, the duration of the disease from the onset to the day of operation; in the fourth, the actual operation performed; and finally, the survivals and deaths, the totals, and the percentage mortality.

The statistics are compiled from the records of the following hospitals. After each hospital is given the name of the surgeon or registrar responsible for collecting the data on which the return is based. The figures in parentheses indicate the number of cases at each place.

St. Bartholomew's Hospital	(305) Mr. Naunton Morgan.
Charing Cross Hospital	(68) Mr. Fitzsimons.
St. George's Hospital	(161) Mr. Marnham.
Guy's Hospital	(207) Mr. Northfield.
King's College Hospital	(130) Mr. H. J. C. Wood.
London Hospital	(863) Mr. Stanford Howard.
St. Mary's Hospital	(104) Mr. Porritt.
Middlesex Hospital	(144) Mr. Wiles.
St. Thomas's Hospital	(384) Mr. Sworn.
University College Hospital	(95) Mr. Flemming.
Westminster Hospital	(66) Mr. Kendall.
Royal Free Hospital	(57) Miss G. Smith.
Royal Victoria Infirmary, Newcastle-on-Tyne	(1019) Mr. G. A. Mason.

CAUSE	AGE DECADE							SITE				DURATION IN DAYS							OPERATION					RESULT		Mortality																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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* Stomach.

Royal Infirmary, Manchester	(1011) Mr. Rowbotham.
General Hospital, Birmingham	(175) Mr. Fauset Welsh.
Royal Infirmary, Liverpool	(88) Mr. Cosbie Ross.
General Infirmary, Leeds	(664) Mr. Armitage.
	Mr. Pyrah.
Royal Infirmary, Sheffield	(295) Mr. Holdsworth.
Royal Infirmary, Bristol	(322) Mr. Jackman.
General Hospital, Bristol	(176) Mr. S. J. H. Griffiths.
Royal Infirmary, Edinburgh	(558) Mr. Weevil.

The comparison with the similar statistics prepared by H. S. Souttar relating to the years 1920-5 is interesting (see MEDICAL ANNUAL, 1927, p. 239). The total mortality in the two periods is just the same, 26·2, but there is an improvement in the figures for intussusception and strangulated hernia.

Professor W. Anschutz¹² gives a table of results from the Kiel Clinic, as follows:—

Table II.—STATISTICS OF INTESTINAL OBSTRUCTION FROM THE KIEL CLINIC.

CAUSE OF OBSTRUCTION	OPERATION FIRST DAY		TOTAL	
	Cases	Died	Cases	Died
Strangulation by band, etc. . .	22	8 (36%)	76	41 (53%)
Volvulus of small gut . . .	11	4 (36%)	34	17 (50%)
Volvulus of colon . . .	10	2 (20%)	33	9 (27%)
Intussusception . . .	43	4 (9%)	83	22 (26%)
Adhesions . . .	31	10 (32%)	121	41 (33%)
Obstruction by cancer . . .	3	1	64	33 (51%)
Obstruction by other causes . .	3	1	17	9 (52%)
Rare, or unknown causes . .	5	1	13	7 (53%)
Total . . .	128	31 (24%)	441	179 (40%)

It will be noted that the figures agree very closely with the English, if the external hernias are omitted.

Volvulus.—After describing eleven cases of volvulus of the pelvic colon at Lyons, M. X. Delore and M. A. Bisch¹³ discuss the best methods of treatment. In toxic cases, or in old patients, they make an **Artificial Anus** on the twisted coil to convert a 'résection à chaud' into a 'résection à froid'. When the loop is resected, whether as a primary or secondary operation, they do not completely close the suture line of the colon in front, but leave in an external drain the size of the thumb. The drainage tube is taken out on the eighth day, and the orifice will eventually close itself without further operation.

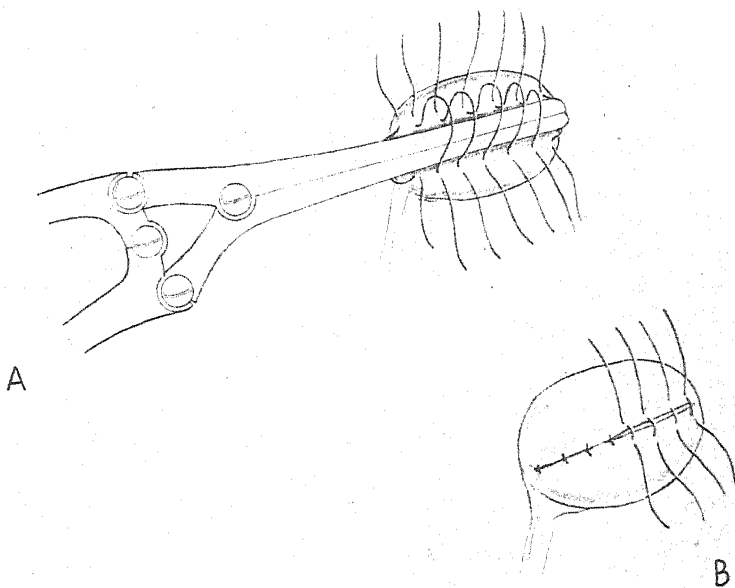
D. Ligat and T. D. Overend,¹⁴ of Hastings, conclude that recurrent volvulus of the pelvic colon is not uncommon, though complete obstruction may not develop. It can be demonstrated by the barium enema followed by air inflation and skiagraphy. They report 12 cases. In 3 of these the loop was resected, with happy results. In the other cases there were repeated attacks of pain, distension, and constipation, followed by watery diarrhoea.

Short-circuiting Intestinal Operations.—According to W. L. Estes and C. E. Holm,¹⁵ an **Entero-anastomosis** (ileo-ileostomy or ileo-colostomy) to short-circuit a mass of intestinal adhesions will only give good results if the obstructed coils resume their function. If the obstruction persists, there will be ulcerative enteritis and dilatation of the loops, with diarrhoea, visible peristalsis, and borborygmi, and resection will be necessary later.

Tumours of the Small Intestine.—Papers on this subject are contributed

by E. D. Kiefer¹⁶ and H. W. Cave.¹⁷ These growths occur at any age ; about half are benign and half malignant. Pre-operative diagnosis is seldom made, but modern radiological methods help towards a recognition. The symptoms are vomiting, poorly-formed actions of the bowels, malaise, and intermittent twinges of pain ; melæna may occur, and the tumour may lead off an intussusception. Sometimes there is a palpable lump. Occult blood is usually to be found in the stools. Operative removal is called for. The benign cases do well, the malignant ones badly. F. H. Lahey advises that a **Short-circuiting Anastomosis** should be performed before resection is attempted, and perhaps also a **Jejunostomy**.

Intestinal Anastomosis.—"The literature on intestinal anastomosis still consists largely of descriptions of technique, though it is doubtful if a single



Figs. 57.—Closure of bowel ends for aseptic lateral anastomosis. Note that end sutures pass under clamp. (Figs. 57, 58 by kind permission of the 'American Journal of Surgery'.)

new principle of operation has been introduced in the last twenty years. Writers seem to assume that the high mortality rate which follows the operation is due to errors in its performance, such as faulty suturing, failure to preserve the blood-supply of the bowel, or the inversion of too wide a flange by the stitches. While mistakes of this kind do increase the death-rate, there is good reason to believe that they are not the chief cause of it. They have been discussed so long and so often that every surgeon is fully aware of them and of how they can be avoided. It is probable that the high death-rate is caused not so much by how the operation is done, as by when it is done." Attempts at anastomosis in the presence of obstruction or distended bowel are likely to lead to bad results, whatever technique is followed. With these remarks, made by W. D. Gatch,¹⁸ of Indianapolis, we cordially agree. He proceeds to

describe a method of aseptic anastomosis which has given him good results in twenty-five cases. He prefers side-to-side unions. The technique is sufficiently clear from the accompanying diagrams and descriptions (*Figs. 57, 58*). [In our opinion, the weak point about the aseptic or closed methods of intestinal anastomosis is that they depend on the theory that bleeding from the cut ends can be safely arrested by crushing clamps, or by the cautery. The theory is not true.—A. R. S.]

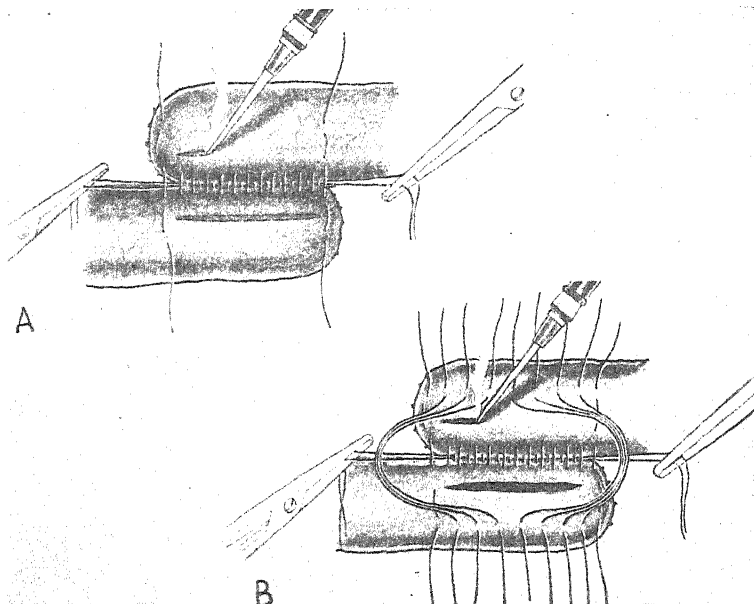


Fig. 58.—A, Closed bowel ends overlapped for about 2 in. and united by two posterior continuous sutures of silk. The first of these is inserted not far from the mesenteric border; the second just in front of it. It is well at the start to place interrupted stitches at each end and in the middle of the course of the first continuous suture, to facilitate its insertion, to ensure its uniform distance from the mesenteric border, and to prevent the making of too long an anastomosis. The ends of the first suture should be left long.

When both posterior sutures are in place, the course of future incisions in the bowel is marked by light strokes with the cautery. These serve as guides for insertion of the inner row of anterior sutures. The cautery marks should be about $1\frac{1}{2}$ in. in length and should extend to about $\frac{3}{8}$ in. of the sutures closing blind ends of bowel. Double Lembert sutures are inserted as shown, beyond tips of cautery marks, to close in the ends of the anastomosis. These are to be tied when anterior stitches, shown in B, are tied.

B, Row of Lembert sutures inserted across the cautery marks and pulled aside to permit burning through bowel along each mark. During this process the entire anastomosis should be held up and steadied by traction on the ends of the posterior suture left long for this purpose.

When cuts in the bowel have been made, the Lembert sutures are tightened quickly and all together, after which they are tied. Anastomosis is completed by continuous anterior suture of silk which is made to approximate blind ends of bowel to the sides of intestine opposite them, so as to cover the sutures used to close the blind ends. This helps to reduce the pockets at each end of the anastomosis.

Non-specific Granuloma of the Bowel.—Under this title J. F. Erdman and C. V. Burt,¹⁹ of New York, relate several cases of a condition first described by Braun in 1909. The paper may serve to throw light on some unexpected findings at an exploratory operation. In one of their cases the last two feet of the ileum, the cæcum, and the ascending colon were greatly thickened so

that the lumen was narrowed and the mucosa was ulcerated. All coats shared in the inflammation. Occasionally a foreign body has been found embedded in the wall. The symptoms are chronic, with fever, colic, vomiting, constipation, loss of weight, and a palpable lump. **Resection or Short-circuiting** gives good results.

REFERENCES.—¹*Ann. of Surg.* 1932, Sept., 368; ²*Brit. Med. Jour.* 1932, ii, 546; ³*Ibid.*, 539; ⁴*Ibid.*, 542; ⁵*Ibid.*, 540; ⁶*Amer. Jour. Surg.* 1933, Feb., 272; ⁷*New Eng. Jour. Med.* 1932, Dec., 1125; ⁸*Ann. of Surg.* 1932, Sept., 364; ⁹*Munch. med. Woch.* 1933, Feb., 176, 219; ¹⁰*Brit. Med. Jour.* 1932, ii, 545; ¹¹*Ibid.*, 546; ¹²*Munch. med. Woch.* 1933, June, 875; ¹³*Rev. de Chir.* 1932, Dec., 775; ¹⁴*Brit. Med. Jour.* 1933, ii, 7; ¹⁵*Ann. of Surg.* 1932, Nov., 924; ¹⁶*New Eng. Jour. Med.* 1933, May, 1042; ¹⁷*Ann. of Surg.* 1932, Aug., 269; ¹⁸*Amer. Jour. Surg.* 1933, May, 341; ¹⁹*Surg. Gynecol. and Obst.* 1933, July, 71.

INTRACRANIAL PRESSURE, INCREASED.

Macdonald Critchley, M.D., F.R.C.P.

Use and Abuse of Hypertonic Salines.—Following the experimental work of L. H. Weed and P. S. McKibben,¹ the administration of concentrated saline has formed the conventional treatment of cerebral œdema and raised intracranial pressure. This measure has been employed in the relief of urgent symptoms in cases of cerebral tumour, uræmia, the neurological catastrophes of hyperpæsis, and meningitis. With much less justification it has also been used in cases of head injury, in post-concussional syndromes, and even in severe headaches of various types, including migraine. The procedure has usually taken the form of an intravenous injection of about 30 c.c. of a solution of NaCl (up to 30 per cent); or of 100 to 200 c.c. of a 50 or 25 per cent solution of glucose; less often concentrated magnesium sulphate has been given per rectum (3 to 6 oz. in water). Where raised intracranial tension has really been present, a prompt and often marked improvement has usually resulted, as shown clinically by a diminution in headache and drowsiness. Direct observation of the brain on the operating table shows a definite shrinkage of the cerebrum. The improvement is, however, quite fleeting, and it has been the practice to repeat the hypertonic solutions as often as desired.

Recent studies have, however, shown the fallacies of the alleged utility of concentrated salines in states of raised intracranial pressure and have demonstrated the possible dangers. M. Ernst² and also G. Milles and P. Hurwitz³ have shown that in animals a secondary rise in intracranial tension succeeds as soon as two hours after the initial fall due to the injection of tonic salines. J. Browder⁴ found that injection of hypertonic saline was followed by a rise in the pressure of the cerebrospinal fluid in 4 out of 9 cases of acute head injuries in man, and he stresses the very great danger of this particular measure. The experimental work of H. Hoff⁵ demonstrated that salt introduced into the blood-stream becomes fixed by the brain-cells, with the result that fluid became attracted once more to the cerebrum, causing a secondary œdema of greater intensity than before. To a somewhat lesser degree, glucose acts in the same way. More recently, H. Jackson, T. Kutsunai, L. O. Leader, and L. D. Joseph⁶ have made careful manometric studies of the pressure of the cerebrospinal fluid before and after the administration of hypertonic solutions of dextrose. In ten cases 100 c.c. of a 50 per cent solution, and in another ten cases 200 c.c. of a 25 per cent solution, of dextrose were injected intravenously. Eleven patients showed an initial drop in pressure of from 1 to 4 mm. of mercury during the first thirty minutes, followed by a gradual rise to a point above the original level in two hours. An increase of as much as 50 per cent occurred in some cases. In twenty-four hours the pressure had returned to its original

reading. An immediate rise in pressure occurred in just under half the patients, continuing with slight fluctuations for two hours and then falling gradually during the next twenty-four hours. Headache was relieved for a short time in some cases, but not to the same degree as obtained by simple withdrawal of cerebrospinal fluid.

REFERENCES.—¹*Amer. Jour. Physiol.* 1919, xlviii, 512; ²*Deut. Zeits. f. Chir.* 1930, ccxxvi, 222; ³*Arch. of Surg.* 1932, xxiv, 591; ⁴*Amer. Jour. Surg.* 1930, viii, 1213; ⁵*Zeits. f. d. ges. Neurol. u. Psychiat.* 1930, cxxix, 583; ⁶*Jour. Amer. Med. Assoc.* 1933, March 11, 731.

INTUSSUSCEPTION.

John Fraser, Ch.M., F.R.C.S.Ed.

As far as intussusception is concerned there has been no development of material significance during the past twelve months. The **Barium Enema** as an aid to diagnosis has been employed in Continental clinics for several years, and those who use it think well of its value. Hitherto it has not been adopted



Fig. 59.—Skiagram of intussusception in the distal half of the transverse colon. (*By kind permission of the 'Lancet'.*)

to any extent in this country, and it is interesting to find a favourable report by R. H. Boggon¹ in which he states that the procedure proved of value in two doubtful cases (*Fig. 59*). The method has been fully described and reviewed in previous issues of the **MEDICAL ANNUAL**.

Eleven cases of intussusception in babies form the subject of a paper by M. Marnière.² He is enthusiastic regarding the value of the barium enema, and in two of his cases the injection was the means of curing the error. When reduction is attempted by means of an enema, whether it be by water or by barium, there is often difficulty in assuring oneself that reduction is complete. Marnière suggests three signs as indicating complete reduction: (1) A clear

cæcal shadow as shown by X-ray; (2) Emission of gas subsequent to the injection; and (3) The tranquillity of the child after treatment. He is satisfied that the method has both diagnostic and therapeutic value. He adds that, if there is the slightest doubt on the question of complete reduction, laparotomy must be performed, and he makes the further point that, even though reduction may not be complete, the invagination is likely to be so materially improved as the result of the injection that it can be completed through a small right gridiron incision.

M. Fèvre³ maintains that intussusception is a more frequent complaint among older children than we generally imagine. Reporting on the cases in Ombredanne's clinic he recounts 20 instances of the disturbance occurring in children above the age of babyhood: 14 of the cases were male children, and the common site of occurrence was the lower end of the ileum. He explains the site incidence by the fact that in the lower ileum there is an unusual type of blood-supply; in a segment of the ileum close to the ileocæcal junction there is a meeting-point of two sources of blood-supply, the superior mesenteric artery and the area supplied through the artery of Treves. At the meeting-point there is a tendency to local arterial spasm, and it is this which induces the onset of the intussusception.

The tendency to recurrence of intussusception has often been the subject of comment. The matter is discussed by A. Thorndike.⁴ The proportion of recurrence has been put at various figures by different observers; Hess estimated it as 1 in 114 cases, while Cohn put it as high as 1 in 70. Thorndike's analysis embraces 405 cases, in 5 of which there was a recurrence—a percentage of 1.2. The complication is not likely to appear until some date after six months, a finding which is explained by the fact that the operative manipulation appears to reduce for some time at least the irritability of the intestine. Thorndike does not suggest any procedure by which the complication can be avoided.

REFERENCES.—¹*Lancet*, 1932, ii, 1051; ²*Bull. et Mém. Soc. nat. de Chir.* 1933, Jan. 21, 70; ³*Jour. de Chir.* 1932, xxxix, 678; ⁴*New Eng. Jour. Med.* 1932, Oct. 13, 649.

JAUNDICE, CATARRHAL, SURGICAL TREATMENT OF.

A. Rendle Short, M.D., F.R.C.S.

Simple jaundice, without gall-stones, may in some cases go on to produce subacute or acute atrophy of the liver. The cause of the jaundice is cholangitis. On 17 occasions H. v. Haberer¹ has felt it necessary to drain the gall-bladder. All but two did well. The method, of course, is not suitable if the intrahepatic ducts are involved. E. Chabrol, P. Brocq, and J. Porin² describe a case of persistent painless jaundice in a woman of 45; on the fiftieth day, as it did not abate, they explored, but found nothing except a slightly enlarged liver. The gall-bladder was drained, and rapid recovery ensued, with return of bile in the motions. A piece of liver removed for biopsy showed a remarkable overgrowth of Kupffer and parenchymatous cells. The jaundice is attributed to inflammation of the bile-ducts and blocking of the sphincter of Oddi. There was a copious discharge of bile from the fistula from the first. This publication evoked another from L. Bérard and P. Mallet Guy,³ who report that injection of lipiodol into the gall-bladder in two cases of cholecystostomy for catarrhal jaundice, lasting forty-two days and two months respectively, showed an exceedingly narrow filiform shadow along the common bile-duct, which they interpret as meaning that in catarrhal jaundice the mucosa of the bile-duct is swollen.

REFERENCES.—¹*Deut. Zeits. f. Chir.* 1933, March, 417; ²*Presse méd.* 1932, July, 1053; ³*Ibid.* Dec., 1920.

JAUNDICE, OBSTRUCTIVE.*Robert Hutchison, M.D., F.R.C.P.*

C. A. Flood¹ and others give the following table of the signs and symptoms in a series of 235 cases of obstructive jaundice which may be of use in differential diagnosis:—

	I. CATARRHAL JAUNDICE, ACUTE YELLOW ATROPHY, ARSPHENAMIN JAUNDICE	II. CARCINOMA OF PANCREAS, GALL-BLADDER, BILE- DUCT, LIVER (PRIMARY)	III. CALCULUS IN COMMON BILE-DUCT
Age	80 per cent under 40 years	80 per cent over 40 years	80 per cent over 40 years
Sex	Catarrhal jaundice, 67 per cent males; acute yellow atrophy, 76 per cent females; arsphe-namin jaundice, 53 per cent females	Pancreas, 72 per cent males; gall-bladder, usually females; bile-duct, evenly divided; liver, usually males	71 per cent females
Degree of jaundice on admission	Variable	Marked, except in primary carcinoma of liver	Variable
Duration of jaundice on admission	Less than 2 weeks in 78 per cent	More than 3 weeks in 65 per cent	Often intermittent, recurrent, or sub-siding
Chief initial symptom	Anorexia, nausea, vomiting, or mal-aise, 60 per cent	Pain, 48 per cent; jaundice, 27 per cent	Pain, 85 per cent
Upper abdominal pain or discomfort	Present in 56 per cent	Present in 65 per cent	Present in 97 per cent
Pruritus	Usually absent, and mild when present	Almost always present except in primary carcinoma of liver	Variable
Loss of weight ..	Usually none ..	Average, 20 pounds	Average, 20 pounds
Asthenia	Usually absent ..	Usually present ..	Usually absent
Prodromal upper res-piratory infection	Present in 25 per cent	None	None
Fever	Usually present ..	Pancreas, usually absent; gall-blad-der, present; liver, present; bile-duct, present	Present
Upper abdominal tenderness	Present in 55 per cent	Absent except in primary carcinoma of liver	Present in 29 per cent
Liver size	Enlarged early ..	Enlarged	Enlarged
Spleen	Palpable in 25 per cent	Not palpable ..	Not palpable
Diabetes mellitus ..	Absent	Pancreas, present in 23 per cent	
Acneform eruption	Often present ..	Absent	Absent
Stool bile	Variable	Pancreas, gall-blad-der, bile-duct, per-sistently negative; liver, positive	Variable

JAUNDICE, SPIROCHÆTAL.*J. D. Rolleston, M.D., F.R.C.P.*

EPIDEMIOLOGY.—The prevalence of spirochætal jaundice in Holland is testified by numerous articles in Dutch literature, e.g., by P. H. Kramer,¹ J. L. A. Peutz,² W. A. P. Schüffner,³ P. Romijn,⁴ and A. Klarenbeek and J. Voet.⁵ Kramer remarks that formerly it was a rare disease in that country, and that it is only within the last few years that the canals and rivers in Holland have become contaminated. He records an outbreak of 22 cases at Rotterdam, where most of the patients had contracted the disease by bathing in rivers or canals. In Peutz's case the patient had not acquired the disease in this way, but from having been employed in a stable swarming with rats. Schüffner states that from Jan. 1 to Oct. 1, 1932, 186 cases were notified in Holland, or not much less than the total number notified in that country since 1924. The incidence varied considerably in different districts, but the two most affected were Amsterdam and Dordrecht. In Amsterdam the disease in most cases was contracted by falling into a canal, while in Dordrecht it was usually caught in swimming baths. According to Romijn, the outbreak at Dordrecht was mild on the whole, there being only one death among 47 cases, 34 of which were attributed to bathing in a canal swarming with infected rats.

Klarenbeek and Voet maintain that in some cases the dog is a source of infection for man, as Weil's disease in the dog is by no means uncommon in Holland, and all cases of acute jaundice in this animal can be regarded as of this nature. It chiefly occurs during the autumn. Epidemics in dogs, however, have never been observed in Holland as they have in England and in Switzerland, but the cases have always been sporadic.

Small epidemics of spirochætal jaundice, probably due to drinking water infected by rats, have recently been reported in Greek islands, by P. Copanaris⁶ and K. Kyriasidis and Petzetakis.⁷ According to Copanaris, 29 cases occurred in three adjacent villages in the island of Cephalonia between March and September, 1932, while the other two writers reported an outbreak of 30 cases with three deaths in Syra between Aug. 14, 1931, and January, 1932. In the Cephalonia outbreak the nature of the spirochæte was not determined, as the result of the agglutination test was negative, but in Syra 10 out of 12 cases examined gave a positive agglutination reaction.

P. Uhlenhuth and E. Zimmermann⁸ draw attention to the increased prevalence of Weil's disease in Germany, and recommend that in cases of obscure fever, especially in those following a fall into contaminated water, the possibility of spirochætal jaundice should be considered.

SYMPTOMS AND COMPLICATIONS.—The occurrence of *Weil's disease without jaundice* is exemplified by the fact stated by P. H. Kramer⁹ that during an epidemic of 75 cases at Rotterdam in the summer of 1932, 28 had jaundice and 45 had none. Six of the first group died, while all the second group recovered. The principal symptoms in the cases without jaundice were conjunctival and episcleral injection and pains in the muscles, especially the calves. Other indications of Weil's disease were tenderness of the eyeballs, photophobia, herpes, the simultaneous occurrence of typical cases, and the patient's occupation (slaughterhouse man or navy).

The following example of *conjugal infection* in Weil's disease is reported by F. P. J. Doeleman.¹⁰ A woman, aged 34, ten days after connection with her husband who was suffering from the disease, developed a mild attack, the symptoms being merely headache, conjunctival injection, and malaise. There was no jaundice, and the urine was normal, but the agglutination test was positive in a dilution of 1-62,500.

Laignel-Lavastine, Y. Boquien, and J. Sterne¹¹ report a case of spirochætosis icterohæmorrhagica complicated by *phlebitis*. The patient was a man, aged

25, in whom the clinical diagnosis of spirochætal jaundice was confirmed by the agglutination test. Thirty-two days after the onset he developed phlebitis of the left leg which lasted three weeks. No previous example of this complication appears to have been recorded.

S. J. R. de Monchy and J. Albronda¹² remark that while meningeal symptoms have frequently been noted at the onset of Weil's disease, the occurrence of definite *cerebral symptoms* has not hitherto been described. They record the case of a man, aged 40, in whom the disease commenced with severe headache, nuchal rigidity, choked disc, extensor response, and hypertension of the cerebro-spinal fluid with increase in its sugar content. The disease was further complicated by *iridocyclitis* in the second week and relapse in the fourth week, but finally recovery took place.

The association of *spirochaetosis icterohaemorrhagica* with other diseases is illustrated by P. C. Cleynndert, jun.,¹³ who records two cases in patients, aged 12 and 19 respectively, in whom spirochætal jaundice was associated with malaria and tuberculous meningitis respectively. The diagnosis of spirochætal jaundice in each case was established by the agglutination test.

DIAGNOSIS.—S. Postmus¹⁴ records 19 cases in which a positive agglutination reaction was obtained in from 1 to 16 years after an attack of spirochætal jaundice. It is therefore possible to make a retrospective diagnosis of the disease for a long period after its occurrence.

TREATMENT.—W. A. P. Schüffner¹⁵ emphasizes the value of **Serum Treatment** in Weil's disease, and also the importance of **Early Diagnosis**, as the serum is only likely to be effective and save life when it is given within the first few days of the disease.

REFERENCES.—¹*Nederl. Tijds. v. Geneesk.* 1932, Sept. 10, 4296; ²*Ibid.* Sept. 17, 4444; ³*Ibid.* Dec. 3, 5548; ⁴*Ibid.* Dec. 24, 5832; ⁵*Ibid.* 1933, lxxvii, 398; ⁶*Bull. Off. internat. d'Hyg. publ.* 1932, Sept., 1427; ⁷*Deut. med. Woch.* 1932, Oct. 28, 1722; ⁸*Ibid.* 1933, 800; ⁹*Nederl. Tijds. v. Geneesk.* 1933, lxxvii, 2652; ¹⁰*Ibid.* 1932, Oct. 29, 5057; ¹¹*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1932, June 27, 1017; ¹²*Nederl. Tijds. v. Geneesk.* 1932, Nov. 5, 5147; ¹³*Ibid.* 1933, lxxvii, 2641; ¹⁴*Ibid.* 2648; ¹⁵*Ibid.* 1932, lxxvi, 4303.

JOINTS, SURGERY OF. (See also BONES AND JOINTS; DEFORMITIES; FRACTURES AND DISLOCATIONS; SPINE, AFFECTIONS OF.)

E. W. Hey Groves, M.S., F.R.C.S.

The Shoulder-joint.—

Rupture of the Supraspinatus Tendon.—It is a matter of common experience that many cases of injury to the shoulder-joint make a very slow and incomplete recovery. In most of such cases the chief residual disability consists in limitation and pain in abduction and in raising the arm above the head. Codman¹ and Wilson² have established the fact that many of these cases present a rupture of the supraspinatus tendon. But it appears now that in addition to frank traumatic rupture there frequently exists a split of the tendon which allows communication between the joint cavity and that of the sub-acromial bursa. E. L. Keyes³ has made a careful anatomical study of 73 consecutive dissecting-room cadavers and he finds that in nearly 20 per cent of these this splitting of the supraspinatus tendon exists. The normal tendon just before its insertion into the greater tuberosity of the humerus is incorporated with the capsule of the joint, and therefore a split of the tendon will involve the joint capsule and will allow communication between the joint cavity and that of the subacromial (subdeltoid) bursa. In all the cases observed by Keyes the patient was over 50 years of age and the appearance of the joint suggested an osteo-arthritic condition. It will be a matter of interest and importance to relate this post-mortem finding with clinical facts. It certainly

PLATE XXXI

CALCAREOUS DEPOSITS AROUND THE SHOULDER-JOINT

(R. C. ELMSLIE)



X ray showing the diffuse shadow above the great tuberosity.

*By kind permission of the
'British Journal of Surgery'*

affords a strong argument for operative exploration of the shoulder-joint in cases of chronic pain and abduction disability in the shoulder. It should be easy to expose the lesion by splitting the deltoid muscle below the tip of the acromion, and then to refresh the edges of the capsule and tendon and unite these by suture.

Calcareous Deposits.—R. C. Elmslie⁴ calls attention to the occurrence of calcareous deposits above and outside the shoulder-joint. He has collected no fewer than 8 such cases in men and women whose ages varied from 30 to 55. In all these the X rays showed a well-marked shadow above the greater tuberosity of the humerus (*Plate XXXI*). In nearly all there was a definite history of trauma. Some had symptoms of long duration and others were comparatively acute. In the majority the painful symptoms were relieved by an operation in which the deltoid was turned aside through an anterior incision in the upper part of the capsule, exposed with the supraspinatus tendon, and the hard mass removed. This was of calcareous nature and must have formed in the floor of the subacromial bursa. Thus it would appear to represent a kind of chronic bursitis, in which, when once the calcareous deposit has been formed, it acts as a further irritant, causing pain and fresh attacks of acute inflammation, provoked by any blow or strain.

Paralysis of Serratus Magnus.—From time to time various operative procedures for the fixation of the scapula in cases of serratus paralysis have been described. In the majority of these the plan of the operation has been to fix or fuse the lower angle of the scapula to the 8th rib. If such fusion is done effectively, it would seem to be the operation of choice. But Armitage Whitman⁵ has suggested and practised successfully in two cases an operation with a different principle. He exposes the whole of the vertebral border of the scapula, bores four holes in the bone, and by means of strips of fascia 8 in. long and $\frac{1}{4}$ in. wide ties the scapula to the spinous processes of the 4th, 5th, 6th, and 7th dorsal vertebrae (*Figs. 60, 61*). In the cases reported the results of this operation appear to have been good, but it seems difficult to believe that strips of fascia $\frac{1}{4}$ in. wide can be strong enough to hold up the weight of the arm, or that the mechanics of this operation can be as sound as those of the fixation of the lower angle of the scapula against the rib.

Paralysis of the Deltoid.—By far the most serious paralysis of the upper arm is that affecting the deltoid muscle. Hitherto it has been customary to regard arthrodesis of the shoulder in a position of abduction as the best method of compensating for this paralysis. Certain operations of muscle transplantation have been tried with a moderate amount of success. In these the pectoralis major and trapezius have been used. Now F. R. Ober⁶ has devised and practised another transplant operation which has had a good result in one case. In this the tendons of both biceps and triceps are utilized to make a new abductor of the arm. An incision is made across the top of the shoulder exposing the acromion process, down the front of the arm exposing the coracoid process and the short head of the biceps, and down the back of the shoulder exposing the long head of the triceps. The short head of the biceps is isolated and the tip of the coracoid process cut off. The long head of the triceps is isolated and the bone from which it arises is chipped off. The acromion is split on the flat. The biceps tendon is sewn into the front of the acromion, the triceps tendon into the back of the same bone, using stout silk sutures for the purpose. In the case described, a girl of 7 who had had poliomyelitis with deltoid paralysis was able after the operation fully to abduct the arm and to raise it to the side of the head (*Figs. 62, 63*).

The Treatment of Tuberculous Disease of the Hip-joint.—This is a subject in which surgical opinion has undergone great changes from time to time.

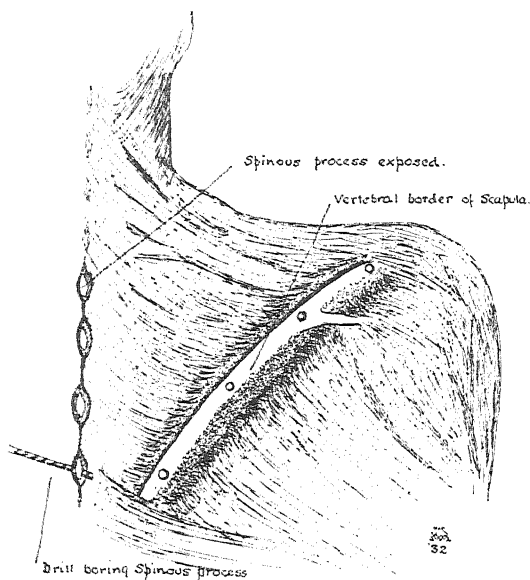


Fig. 60.—Exposure of the displaced scapula and of the spinous processes.

Fig. 61.—Operation completed; scapula sutured in position."

(Figs. 60, 61 by kind permission of the 'Journal of the American Medical Association'.)

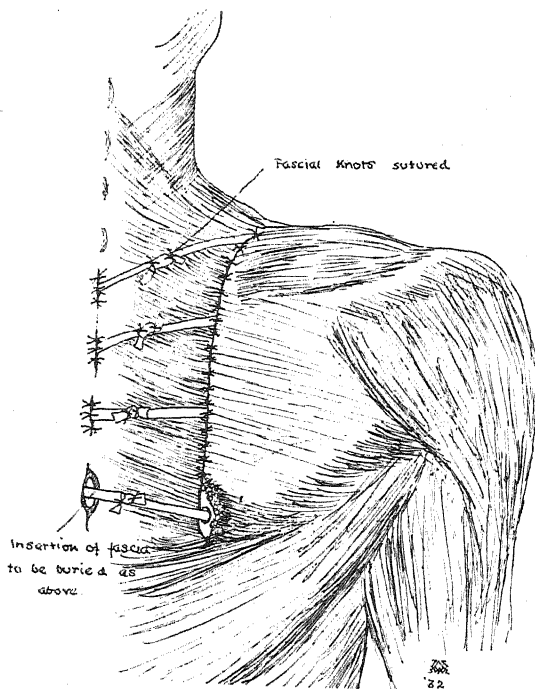


Fig. 62.

Deltoid paralysis,
before operation.
Note extreme atro-
phy of deltoid muscle.
Abduction is per-
formed by the tra-
pezius.

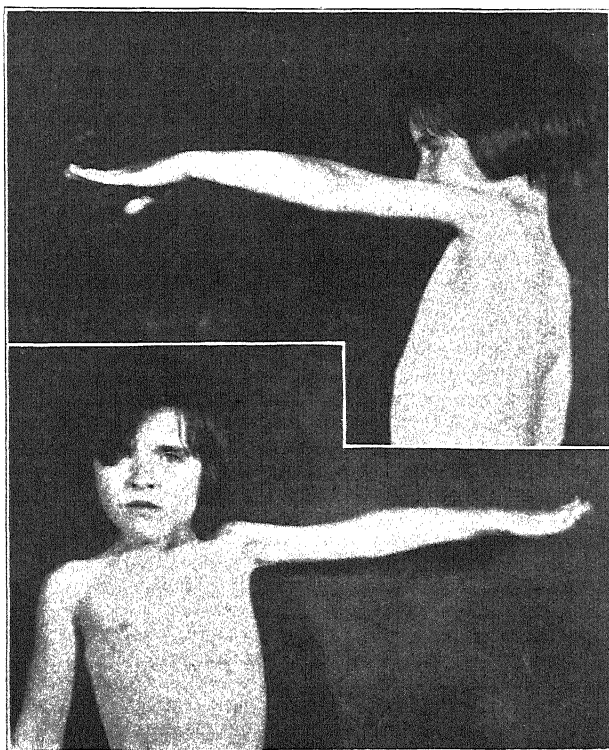
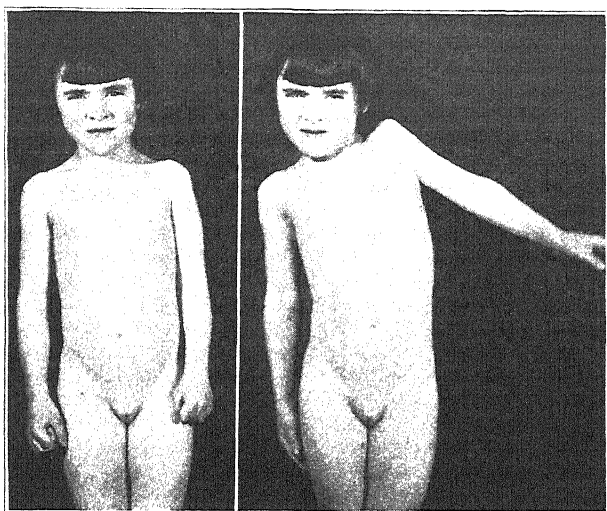


Fig. 63.

Same case, three
months after opera-
tion. Showing func-
tion in the transplant.

(Figs. 62, 63 by
kind permission of the
*'Journal of the Ameri-
can Medical Associa-
tion'.*)

In the old days excision was practised almost as a routine, those being the days when these cases were treated in general hospitals. Then came the revulsion. Sanatoria were established and the fine results of open air with prolonged rest were held to justify extreme conservatism. And in general it may be said that conservatism still remains the dominant note in this country. But in America and on the Continent, largely stimulated by the pioneer work of Hibbs and Albee, the idea that operation has no place in the treatment of the tuberculous hip has been successfully challenged, so that in many centres it is now held that operation should be considered in most cases.

Clearly, wisdom in this matter lies in wisely choosing a *via media* between the extreme of ultra-conservatism on the one hand and routine operation on the other. What, then, is the justification for operating on cases of this disease, when they do so well with rest and sanatorium treatment? There are two main reasons—namely: (1) Conservatism in many cases does not lead to a cure, but merely allows of chronic invalidism; and (2) Many comparatively favourable results take so long in producing recovery. Incompleteness of cure and length of time are therefore the justification for attempting operative intervention.

But in defence of the conservatism of the English practice it must be pointed out that many cases do recover completely within a period of one or two years without operation, and also that these include a fair proportion of complete recoveries—that is to say, the child regains a normal joint with proper movements. If these two points are conceded, then it would appear to be wise practice to treat all cases, and certainly all children, by conservatism for at least one year, and to reserve consideration of operation for only those cases that do not show a good response within such a period. There are four main indications for operation: (1) Adult age; (2) Failure of conservatism to arrest the disease after one or two years; (3) Relapse, especially the occurrence of pain and deformity after conservatism; (4) Certain destructive lesions, e.g., the formation of sequestra in the head or neck of the femur or in the acetabulum.

The modern operation is, of course, quite different from the old-fashioned excision, which involved great danger of generalizing the disease, and which, when successful, left a weak flail joint. The operation now aims at fusion or internal fixation of the joint in a good functional position.

O. L. Miller⁷ gives an account of the modern American operation in which he follows Wilson's technique. He insists on waiting several months for the temperature to settle to a normal level, for the child to gain weight, and to have all the advantages of heliotherapy. The joint is exposed by a Smith-Peterson incision and its articular surfaces are exposed, with removal of cartilage. The base of the neck of the femur is split down to the shaft on the inner side of the trochanter; the roof of the acetabulum is likewise split, and into the gap so made a piece of bone taken from the crest of the ilium is driven, whilst small bits of bone are wedged into any vacant spaces. The limb is put up in a straight slightly abducted position in a plaster spica. The child is allowed up in the spica after three to four months, and after twelve to eighteen months can walk without support. The existence of sinuses or the encountering of free pus during the operation does not contra-indicate its performance. Sometimes the operation has to be repeated, usually because it has been done too early, and then a piece of the tibia is to be used as the graft. Miller reports 45 cases with one death, and in 6 of these an operation for re-fusion had to be done. He holds that the shortening of the time of treatment and the freedom from recurrence amply justify the employment of this treatment.

A. Delahaye and J. N. Courvoisier⁸ urge the advisability of some form of arthrodesis in certain types of hip disease. They distinguish three kinds of operation, each of which has its special indications. These are as follows:—

PLATE XXXII

TUBERCULOUS DISEASE OF THE HIP-JOINT

(A. DELAHAYE AND J. N. COURVOISIER)



Result obtained three years after extra-articular arthrodesis.

By kind permission of 'La Presse médicale'

PLATE XXXIII

TUBERCULOUS DISEASE OF THE HIP-JOINT--*continued*
(A. S. BLUNDELL BANKART)



Bankart's Case 5. Skigrams showing condition before and after operation.

By kind permission of the 'British Journal of Surgery'.

1. Extra-articular. In this the joint cavity is not opened, but a graft from the tibia or trochanter is placed between the trochanter and the side of the ilium. This is indicated in adult cases where the X rays show that the articular cartilage has been destroyed, but in which there is no gross bone lesion (*Plate XXXII*).

2. Mixed type. In this the joint is opened and explored and a graft afterwards fixed in place. It is used when there are definite sequestra shown by the X rays either in the head or neck of the femur or in the acetabulum.

3. Intra-articular. This is reserved for cases with destruction of the head or neck of the bone. The débris is removed and the shaft of the femur or the top of the trochanter is firmly implanted into the acetabulum.

The most startling and revolutionary suggestions have been made recently by A. S. Blundell Bankart⁹ about the treatment of tuberculous hip disease. He begins by casting grave doubt on the optimistic reports of the modern conservative methods. But in this he is content to issue a general denial of good results, based upon cases which have remained uncured or which have relapsed, rather than attempt any survey of the proportion between successes and failures. He accepts the suggestion made by Pugh that hip disease generally starts in the ilium and acetabulum in a very uncritical spirit, and ignores the fact that very often it starts in the head or neck of the femur or in the synovial membrane. He contends that actual healing can only take place by bony fusion of the diseased surfaces of femur and acetabulum, and that therefore extra-articular arthrodesis is irrational as tending to prevent such fusion. Lorenz's method of fixing the joint in good position by a short spica and of then allowing weight-bearing, tried in 800 cases with good results, is commended as embodying this idea of promoting bony fusion rather than of attempting to keep the bone surfaces separated from one another. Bankart then proceeds to give details of 9 cases of tuberculous hip disease in which he has carried out an extensive excision with good results. The operation is much more formidable than the classical excision, which consisted merely in removal of the head of the femur. Bankart's operation involves removal of the acetabulum itself by division of the ilium above and the pubis and ischium below the socket. The head and neck of the femur are also removed. In 6 of his cases the disease had been of very old standing and in 3 it was comparatively recent. The following gives the sex, age, and period of the disease :—

Case 1: F., 62, diseased for 58 years. *Case 2:* F., 30, diseased for 14 years. *Case 3:* F., 23, recent disease. *Case 4:* F., 26, diseased 18 years. *Case 5:* M., 54, diseased 44 years (*Plate XXXIII*). *Case 6:* F., 21, diseased 2 years, *Case 7:* F., 16, left hip had been fixed by arthrodesis 3 years previously, right hip recently diseased and now excised. *Case 8:* M., 42, recent disease. *Case 9:* M., 41, diseased 35 years.

In all these cases the extensive excision of acetabulum together with the head and neck of the femur was done with remarkably good results as observed for periods of one or two years. The hip-joint remained stable, and in all but one case in which ankylosis occurred, the joint was freely movable. Unfortunately after this brilliant series of successes, the author had to record two fatal cases—one in a boy of 8 in which troublesome bleeding occurred during the operation, and the other in a girl of 13 who died a few days later from a pulmonary embolism.

Bankart himself admits the gravity of the operation, which he advises should always be done with the precaution of a concomitant blood transfusion. Probably if this operation were generally adopted the operative mortality would be 30 or 40 per cent rather than the 18 per cent recorded by Bankart. But

because this surgeon presents his arguments in an extreme and not very judicious manner, we must not overlook the real value of his work. There is very little danger of conservatism or arthrodesis being abandoned as the main methods of treating hip disease. Conservatism can claim many cases of cure with perfect, mobile hips. Arthrodesis can claim that treatment is shortened and relapses are minimized in cases which do not yield to conservatism, and at the expense of a very simple operation with very low mortality. Bankart proves that in those cases of adults with severe and destructive disease of the acetabulum a cure can be effected by a wide excision of the disease, and he makes good his claim that this operation is the only method of curing the disease in cases of this type.

Tuberculous Disease of the Knee-joint.—According to modern hospital policy, cases of tuberculous knee-joints are seldom seen in the wards of a general hospital. They are sent as children to a sanatorium or as adults to a municipal hospital. For this reason, then, it is difficult to standardize treatment of a condition which presents so many aspects and which varies so much according to the age of the patient. Both students and practitioners may be forgiven, therefore, if they have hazy and crude notions about this subject. These notions commonly are : In a child—send him away to an institution and let them take the responsibility ; In an adult—fix in a plaster or caliper and advise amputation if he becomes impatient about his slow progress. It ought to be very exceptional for any case of tuberculous knee to require amputation. It should seldom be necessary for any adult to waste time with immobilization methods.

J. H. Cyriax¹⁰ has done good service by carefully examining and reporting on all the cases of tuberculous knees which occurred during the ten years 1920-30 at the orthopaedic department of St. Thomas's Hospital in London and at the Pyrford Sanatorium. In all he deals with 78 cases, and in these no fewer than 68 were of the synovial type and only 10 of the bony. The decision that the disease is primarily in the bone is made by the X-ray appearance. Any local rarefaction (apart from general decalcification) is held to prove a diseased focus. The difference in the clinical course of these two types, synovial and bony, is very marked. The cases of primary bone infection are more amenable to treatment, and no less than 50 per cent recovered with a movable joint. But if not operated on, these cases show a high mortality (30 per cent).

The synovial cases, on the other hand, are very resistant to treatment in the sense that mere fixation very seldom, if ever, produces a real recovery. At the best an unstable fibrous ankylosis, in faulty position or requiring the use of a caliper, is the result of mere conservatism.

Another interesting observation is made in regard to the diagnosis and its relation to treatment. The majority of cases in this series were subjected to a biopsy, and there was not one recovery of a movable joint in any case proved to be tuberculous synovitis. On the other hand, in the unproven group about 20 per cent recovered a good range of movement after simple fixation and conservatism. Cyriax's conclusions, which are as follows, seem amply justified by the case results he has reported, and are in accord with general experience :—

1. In all cases above 9 years a synovectomy and biopsy should be done, to be followed by an arthrodesis if the case is proved to be tuberculous. In cases below 9 years, whatever be the findings, only conservative fixation will be used, and therefore there is no object in a biopsy.

2. In all adults arthrodesis should be the method of choice, and there is no justification for spending months or years in a preliminary fixation. The only problem is how old the patient should be to be included in this class—certainly cases of 15 or over ; probably even children over 9 should be treated on these

lines. If the arthrodesis is done properly, there need be no interference with the epiphysial cartilage or the growth of the limb. Formal excision is not necessary, but all the synovial membrane must be removed together with the articular cartilages.

3. Arthrodesis is unsatisfactory if done before the age of 9. The bone-ends are soft and yielding and the limb will require to be just as carefully fixed by plaster or splints after the operation as if no operation had been done.

4. In every case of a primary bony focus, operation should be done without delay. The bone focus is to be erased or excised, if possible, without opening the joint.

It is very interesting and important to observe that in the case of tuberculous disease both of the hip and the knee, the tendency of recent years has been to depart from the rigid conservatism of the past generation and to recognize that in most cases other than young children cure of the disease, as well as shortening of the period of invalidism, are best served by operative intervention.

Tennis Elbow.—This common and painful affection is still the subject of much debate. Probably there has been some confusion of ideas owing to the fact that there are two quite distinct painful affections of the outer or lateral portion of the elbow. In one there is an arthritis or possibly an internal derangement of the radio-humeral joint. In the other, the true tennis elbow, there is a fibrositis and later periostitis affecting the bony origin of the extensor muscles from the lateral epicondyle. The two conditions may be distinguished by their different behaviour in regard to pronation and supination. These movements are always painful and limited in the radio-humeral arthritis, whereas they are quite painless in the true tennis elbow provided the wrist and fingers are kept extended.

Hohman¹¹ has made useful observations on these conditions. He considers that the true tennis elbow is always an epicondylitis in which definite periostitis appears sooner or later. The reason why the origin of the extensors rather than the flexors is always involved is that the constant action of the extensors is required in order to give synergic action to the flexors.

TREATMENT.—In the treatment Hohman distinguishes between early and late cases. In recent cases **Rest** is essential, and this must be applied both to the elbow- and wrist-joints. It is secured by fixing the arm on a light moulded splint, the elbow in flexion to about 100° and the wrist in slight dorsiflexion. The splint comes down to the knuckles so as to leave the fingers free. **Diathermy** and **X Rays** are also useful for the treatment of the pain, but massage is definitely contra-indicated. In the late or chronic cases, the X rays generally show some periosteal thickening over the lateral epicondyle. In such cases a simple operative procedure produces excellent results and should therefore be resorted to without hesitation. A short curved incision is made over the lateral epicondyle and the upper part of the common extensor tendon divided (*Fig. 64*). This would certainly seem to be a rational proceeding and well worth a trial.

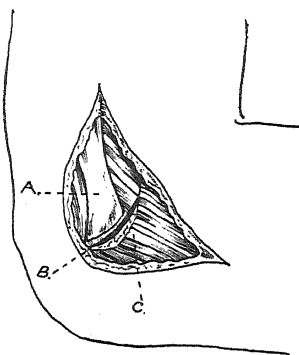


Fig. 64.—Showing Hohman's operation for chronic tennis elbow. A, Lateral epicondyle of humerus; B, Incision dividing the extensor tendon; C. (Reproduced from the 'Münchener medizinische Wochenschrift'.)

The Treatment of Ankylosed Joints.—The experiences of the last twenty years, since Murphy first proposed the operation of arthroplasty, have now enabled us to judge of the possibilities that surgery has to offer in this condition. Willis C. Campbell¹² has recently reviewed the whole subject. He points out that joints which have become fixed by acute septic infection offer by far the best scope for the operation. In regard to individual joints, the elbow, hip, and knee are those which most often require operation and

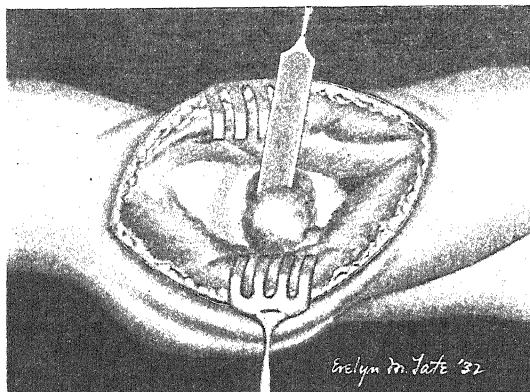


Fig. 65.—Separation of ankylosis of hip and remodelling of head of femur, care being used to alter the contour of the head as little as possible.

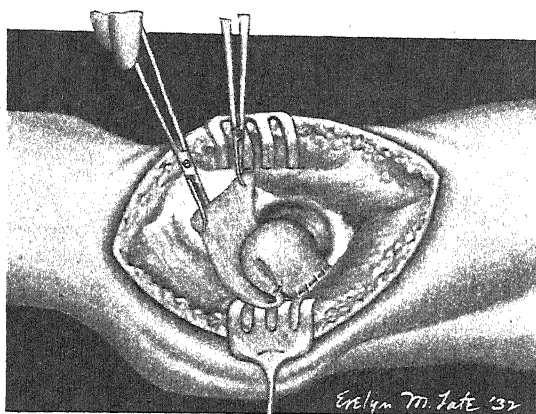


Fig. 66.—Interposition of free fascia lata placed to cover the head and acetabulum, thus making a double layer or practically closed sac when the reduction is made.

which give the best results. The mandibular joint must always be treated, but in this an excision with free removal of the condyle is all that is necessary. The finger-joints are the most difficult in which to attain success, and in these only a small range of movement must be considered a good result.

In regard to the major joints, there should always be three points aimed at: (1) The division or freeing of the soft parts round the joint; (2) Proper

shaping of the bone-ends so as to form a good ball-and-socket or hinge; and (3) The interposition of a double layer of fascia lata. This latter procedure, which is so essential to success, does not merely aim at preventing bony union. It also provides for the formation of a new synovial lining to the joint and the secretion of synovial fluid. The author illustrates his article by figures of the elbow, hip (*Figs. 65, 66*), and knee, and shows how the new joint appears years after the operation, as seen by X-ray pictures (*Figs. 67, 68*).

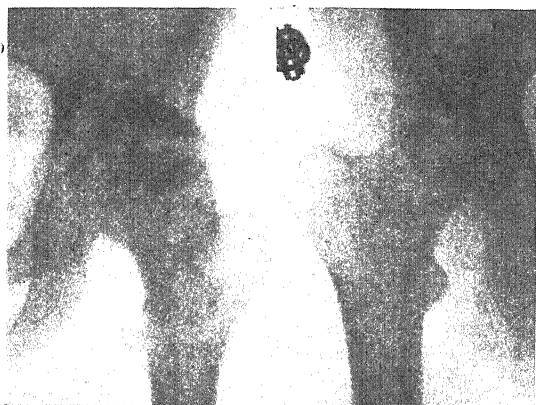


Fig. 67.

Fig. 68.

Fig. 67.—Bony ankylosis of hip following infectious arthritis.

Fig. 68.—Same case four years after arthroplasty. The contour of the head of the femur and the acetabulum is well adapted for excellent function and the range of motion is practically normal.

(*Figs. 65-68 by kind permission of 'Surgery, Gynecology and Obstetrics'.*)

Probably the implanted fascial lining does not retain its integrity. In time it is converted into fibrocartilage. But a true joint cavity is maintained and a good range of movement is preserved.

REFERENCES.—¹*Ann. of Surg.* 1931, xciii, 348; ²*Jour. Amer. Med. Assoc.* 1931, xvi, 433; ³*Ann. of Surg.* 1933, June, 849; ⁴*Brit. Jour. Surg.* 1932, Oct., 190; ⁵*Jour. Amer. Med. Assoc.* 1932, Oct. 15, 1332; ⁶*Ibid.* Dec. 24, 2182; ⁷*Amer. Jour. Surg.* 1933, June, 555; ⁸*Presse méd.* 1933, May 10, 757; ⁹*Brit. Jour. Surg.* 1933, April, 551; ¹⁰*Jour. Bone and Joint Surgery*, 1932, Oct., 847; ¹¹*Munch. med. Woch.* 1933, Feb. 17, 250; ¹²*Surg. Gynecol. and Obst.* 1932, Dec., 747.

KALA-AZAR.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—P. Giraud¹ discusses the mode of contraction of the infantile or Mediterranean form of kala-azar, as seen in the South of France, and its relationship to the canine infection. It is common in the Marseilles region, where he has seen 95 cases since 1922, more than half being in infants of 1 to 2 years of age in all classes of society, but especially among people possessing a garden near the sea. The disease is very widespread in dogs and affects their skin in the areas with human kala-azar cases; the writer has successfully inoculated a dog with the human parasite, and he considers that these animals are a frequent, but not an invariable, source of infection. Sandflies are rare in the affected area, and ticks convey the infection from one dog to another and possibly also to the children, while they are often present in large numbers. Infection through the digestive tract has never been proved. The

immediate destruction of all dogs showing ulceration of the skin is important in prophylaxis.

P. Giraud and R. Poinso² discuss the causes of hæmorrhages in kala-azar, and find a decrease in the coagulability of the blood, as long ago observed in the Indian form. They advise giving **Serum** and **Calcium Chloride** or a **Transfusion of Blood**, together with the usual treatment by **Antimony Salts**, and **Radiotherapy over the Spleen** in moderation, but the little patients are not in a condition to stand splenectomy. The incidence of kala-azar in Madras is dealt with by L. E. Napier and K. V. Krishnan,³ who point out that the disease is endemic there and subject to much less variation from year to year than it is in Bengal and Assam, and they believe the disease to be spreading slowly in the province, and that one of the main predisposing causes of kala-azar in rural areas is malaria. They also deal with the clinical types of kala-azar in Madras, and find little difference from those of the disease in Bengal and Assam except that the chronic ambulant type is more common and the acute epidemic types are much rarer in Madras. Moreover, the proportion of dermal to visceral leishmaniasis is very high in Madras, not so high in Bengal, and very low in Assam, and consequently the dermal form is in direct proportion to the chronicity of the leishmania infection in a population.

Infection of *Phlebotomus argentipes* from dermal leishmaniasis lesions is reported by L. E. Napier, R. O. A. Smith, and C. R. Das Gupta⁴ in an important paper. The not infrequent cases in which recovering but incompletely cured cases of kala-azar, whether spontaneously or after antimony treatment, develop very numerous nodules in the skin of the face and body containing many *L. donovani* bodies, are thus rendered a possible source of infection. *P. argentipes* have therefore been fed on such nodules, with 2.63 per cent of positive results in the form of extensive flagellate development in the sandflies after a single feed, while when the flies were kept alive by three or four subsequent feeds on uninfected mice no less than 28.89 per cent became infected with the parasite. Moreover, infection may take place from the very earliest skin lesions, which would only be recognized by an expert, so it is quite possible that a person may be infective to the flies before showing visible skin lesions. As these dermal cases are very chronic, they may well constitute an important reservoir for carrying the infection over the season of minimum infections. Fortunately these dermal cases are amenable to prolonged antimony treatment, which destroys the parasites and renders them uninfactive.

PATHOLOGY.—J. C. Ray⁵ has obtained fairly abundant growth of leishmania parasites on a solid medium by the use of Noller's glucose-blood-agar modified by the addition of 2 per cent peptone, 2 per cent meat extracts, and certain salts. He uses a test-tube with a bulge on the under surface when placed horizontally to retain the medium and the water of condensation. L. E. Napier, K. V. Krishnan, and J. C. Lal,⁶ publish Parts IV and V of their studies of the cytology of the blood and tissues, with a coloured plate, and conclude that the large mononuclear monocytes and histiocytes keep down complicating malarial infection in kala-azar by a phagocytic action, but that a specific humoral response is probably a necessary factor.

TREATMENT.—U. Brahmachari and others⁷ record a further series of cases treated successfully by an intensive course of about ten daily injections of **Urea Stibamine**, totalling about 1.5 grm. The same worker⁸ reports a successful trial of **Sodium Sulphomethyl Stibanilate** in 15 cases in doses increased from 0.1 to 0.4 grm. intramuscularly.

REFERENCES.—¹*Presse méd.* 1932, Sept. 7, 1368; ²*Ibid.* 1933, Jan. 14, 72; ³*Ind. Jour. Med. Research*, 1933, July, 155; ⁴*Ibid.* 173; ⁵*Ibid.* 1932, Oct., 355; ⁶*Ind. Med. Gaz.* 1933, Feb., 66 and 75; ⁷*Trans. Roy. Soc. Trop. Med. and Hyg.* 1933, Jan. 31, 389; ⁸*Jour. Trop. Med. and Hyg.* 1933, Jan. 2, 1.

KETOGENIC DIET. (See PYELOCYSTITIS; PYURIA IN CHILDREN; URINARY ANTISEPTICS.)

KIDNEY. (See also RENAL DISEASES.)

KIDNEY, SURGERY OF.

Hamilton Bailey, F.R.C.S.

Malignant Tumours of the Kidney.—The cardinal clinical features of malignant renal tumours are lumbar pain, hæmaturia, and the presence of a lump in the kidney region. Collective research shows that one or more of these symptoms are present in 99 per cent of cases (W. Walters¹), and approximately 50 per cent have a history of loss of weight (J. A. Lazarus²). Avoidable delay in diagnosis is in evidence everywhere; for instance, in a large series of cases at the Mayo Clinic the average time symptoms had been present before nephrectomy was twenty months. In another series many of the patients had had symptoms for over a year. J. A. Lazarus pleads that in cases of hæmaturia if only the public and the general practitioner could be made to realize the importance of having an immediate thorough urological examination, a great step forward would be made. In over 80 per cent of cases of malignant kidney painless hæmaturia is an early sign.

R. J. Swan³ urges the profession to take a more serious view of hæmaturia. So often the hæmorrhage clears up with rest, and the patient, and often his doctor, are lulled into a sense of false security while the growth becomes inoperable. Cystoscopy should be undertaken, if possible, when the bleeding is in progress.

In early cases of renal neoplasm where there is an appreciable amount of unaffected renal parenchyma, the renal function tests may be unimpaired (A. Ciminata⁴).

Pyelography is exceedingly helpful in establishing an early diagnosis in both renal and peri-renal tumours. (D. E. Eisendrath⁵ and M. J. Gibert.⁶) K. Boshamer⁷ shows in a series of beautifully reproduced pyelograms, of which Fig. 69 is one, how readily the



Fig. 69.—Pyelogram showing a neoplasm of the lower part of the kidney distorting a calix and obliterating the inferior calices. (By kind permission of 'Archiv für Klinische Chirurgie'.)

diagnosis of neoplasm of the kidney can sometimes be made by this means. A. Ciminata describes pyelography as the most important method of diagnosing a renal neoplasm in its curable stages.

The hypernephromata (an unfortunate term) are much the commonest renal neoplasms; R. J. Swan stipulates that it should be recognized that these growths are carcinomata. Some patients with a squamous-celled carcinoma of the kidney have a long-standing history of infection or renal calculus. A. J. Scholl⁸ reports two examples of kidney carcinomata which were secondary to a calculus. Sarcoma of the kidney is comparatively rare; E. S. Judd and J. M. Donald⁹ found 28 cases in 570 malignant tumours of the kidney.

Malignant renal tumours metastasize most frequently in the lungs (44 per cent), while the liver is involved in 20 per cent of cases. Skeletal metastases occur in 8 per cent (J. A. Lazarus); the bodies of the vertebrae, humerus, and femur are common sites (R. J. Swan).

TREATMENT.—**Nephrectomy** for malignant disease should include removal of not only the kidney but of the perinephric fat, the adrenal gland, and the lymphatics along the aorta and vena cava. In favourable cases these structures can be removed *en bloc*. In order to effect this dissection the anterior route is easily the best, and it has the additional advantage of allowing early access to the renal vessels, the engorged veins of which are liable to be a cause of troublesome hæmorrhage (R. J. Swan).

It is well known how renal neoplasms tend to grow into the renal veins, and thereby become disseminated by the blood-stream; on the right a neoplastic outgrowth has often been seen projecting into the vena cava. J. B. Priestley and W. Walters¹⁰ in two instances of this kind opened deliberately the vena cava and extracted the carcinomatous polyp. The vena cava was afterwards sutured with oiled silk. Both patients made a good recovery.

In tumours of the renal pelvis D. W. MacKenzie and M. Ratner¹¹ urge that simple nephrectomy is too conservative. If recurrence is to be avoided, **Complete Ureterectomy** must be performed in addition.

In all cases of renal neoplasm prophylactic post-operative deep **X-ray Treatment** is advised in addition to operation by most of the writers.

That with early diagnosis these otherwise inevitably fatal growths are curable by nephrectomy is shown by Swan's series, where patients have survived a period of ten years or more. E. S. Judd and E. A. Wilkinson¹² report three cases of carcinoma of the kidney. Two had nephrectomy in 1915 and one in 1906. All three are alive and well at the present time (1933).

Peri-renal Lipomata.—These form a substantial proportion of retroperitoneal tumours. They are not, as their name implies, entirely benign. In spite of the histological report of lipoma, recurrence is not unknown. Many of the tumours are probably lipo-myxo-sarcomata. J. de J. Pemberton and J. M. McCaughan¹³ agree with Le Fur in considering all para-renal tumours as malignant, and in order to diminish the risk of recurrence advise their extirpation as widely as possible.

Congenital Cystic Kidneys.—The condition is usually bilateral. There are a few cases where one kidney is much more diseased than its partner, and if a diseased organ is a source of trouble, and if it can be shown that the contralateral organ is functioning adequately, **Nephrectomy** is indicated. Such a case is recorded by H. Collinson,¹⁴ who quotes other examples from the literature. The results have been successful. Congenital cystic kidneys are very prone to infection, and when this complication has supervened the diagnosis becomes exceedingly difficult unless information as to some previous examination is available. (Alexandresco-Dersca et al.¹⁵)

Horseshoe Kidney.—There is but one reliable method of diagnosing a horseshoe kidney, and that is by pyelography. The calices of such a kidney are directed towards the spinal column (*Plate XXXIV*). The only condition with which this appearance might be confused is an abnormality of rotation. Fortunately, however, both kidneys are not usually rotated and the pyelogram of the partner kidney would be likely to have a normal appearance. A. Jacobs¹⁶ considers that lumbar extraperitoneal incision should always be chosen for operations upon a horseshoe kidney, for so often fused kidneys are infected, and after resection of a diseased half of such a kidney there is a definite risk of leaking from the cut isthmus.

PLATE XXXIV

HORSESHOE KIDNEY

(A. JACOBS)

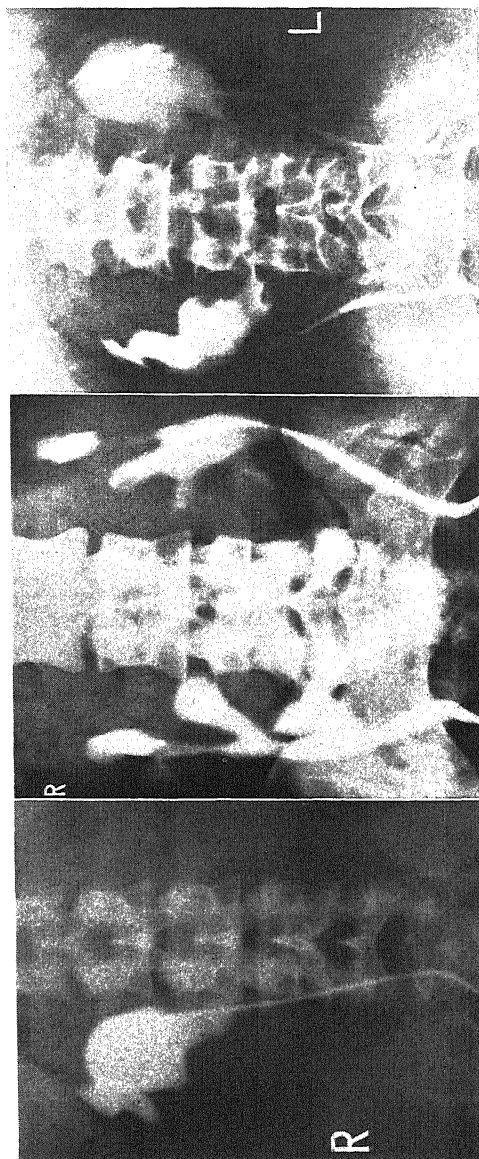


Fig. A

Fig. A.—Ascending pyelogram of right kidney. The pelvis lies close to the vertebral column, and the lowest calix, pointing downwards and medialwards, is in apparent contact with a vertebral body.

Fig. B

Fig. B.—Bilateral ascending pyelogram of another case. All the calices point medialwards, except the upper.

Fig. C

Fig. C.—Bilateral ascending pyelogram of a third case. Note how the upper calices overlap the pelvis on the left side.

By kind permission of the 'Lancet'.



Renal Tuberculosis.—Twelve aphorisms culled from the current literature may be useful to the practitioner:—

1. Frequency of micturition is present in varying degrees in all cases (H. Moore¹⁷).

2. Tuberculous hæmaturia differs from that of tumour, stone, and hæmorrhagic nephritis because its coagula are shorter, less worm-like, and more pallid. Tuberculous hæmaturia is made worse by exertion (E. Leni¹⁸).

3. When a tuberculous epididymis is discovered a renal focus should be suspected (W. F. Braasch and De La Pena¹⁹).

4. Patients with even advanced pulmonary tuberculosis but healthy kidneys do not excrete tubercle bacilli in their urine (J. Menton²⁰).

5. The demonstration of the tubercle bacillus in the urine is the most certain method of diagnosing a tuberculous kidney in its early stages (G. Marion, quoted by E. Leni¹⁸).

6. If in a film stained with methylene blue one notices red blood-cells and degeneration of polynuclears and the absence of micro-organisms, one should search once more for the tubercle bacillus (Ganthier, quoted by E. Leni¹⁸).

7. If in doubt inoculate a guinea-pig with urine from the suspected kidney (Marion, quoted by E. Leni¹⁸).

8. Upon cystoscopic examination in approximately 95 per cent of all cases the first feature noted is a diminished bladder capacity, which may vary from 250 to 120 c.c. (H. Wade²¹).

9. There is no contra-indication to the use of indigo-carmin for chromocystoscopy, even in advanced cases of renal tuberculosis (A. Puigvert²²).

10. Tuberculous nephritis (a non-specific inflammation due to the direct local action of the bacilli) does not exist (F. Lieberthal and Von Huth²³).

11. When clinically established, renal tuberculosis never heals completely (R. Day²⁴).

12. In the absence of some definite contra-indication the only treatment which should be recommended in early unilateral tuberculosis is nephrectomy (J. Brumwell²⁵).

Pyelovenous Backflow.—It has been proved beyond doubt that excessive pressure within the kidney pelvis ruptures the mucosa and allows the contents of the pelvis to pass into the venous system. Such increased pressure is brought about in two ways: (1) By retrograde pyelography without due care; (2) By squeezing the kidney while performing nephrectomy, especially in purulent cases where the ureter is obstructed. The prevention lies in: (1) Never exerting pressure greater than 30 mm. of mercury during the performance of instrumental pyelography; (2) Gently handling the kidney during nephrectomy.

Three cases of fatal pyelovenous backflow are recorded—one tuberculosis, and two of colon bacillus septicæmia—all following nephrectomy. H. L. Cecil²⁶ considers that in nephrectomy for tuberculous pyonephrosis the first stage should be division of the ureter with insertion of a catheter into its proximal end in order to drain away the pus. The interior of the kidney being now freed from pus under pressure, the organ can be handled with comparative impunity. So great is the danger of pyelovenous backflow in closed tuberculous pyonephrosis that Cecil concurs with others that probably the best method of preventing this disaster is to ligate the renal vessels via the abdominal route before removing the kidney through a lumbar incision.

The Prevention of Renal Complications following Scarlet Fever.—B. A. Peters²⁷ states that the use of antitoxin has not reduced appreciably the incidence of renal complications of scarlet fever. This author finds such complications are diminished by drenching the patients with **Alkalis**. In

addition he gives **Tincture of Iodine** and **Thyroid Extract** in appropriate doses according to age.

O. Bieling²⁸ advises increasing the **Fluid Intake** and **Rubbing Fat upon the Skin** during the desquamating stage. The latter decreases perspiration and by thereby increasing renal output it acts as a mild diuretic.

Renal Sympathectomy.—Renal sympathectomy was performed first by E. Papin²⁹ in 1921 for renal pain associated with dilated renal pelvis. The operation is slowly gaining for itself a definite place in the surgery of the kidney. The chief indication for the operation is renal pain associated with an adynamic renal pelvis—that is, one not due to any organic lesion. Such

a condition is known as 'renal sympatheticotonus'. Doubtless there have been many patients with this condition drifting from clinic to clinic, undiagnosed even after exploratory nephrotomy. Renal sympatheticotonus is not, as some imagine, a highfalutin name for indefinite backache; it is a lesion capable of accurate diagnosis, and before this diagnosis can be made, several, if not all, of H. and R. G. S. Harris's postulates must be fulfilled; these are as follows: (1) Reproduction of the pain on distension of the renal pelvis; (2) Demonstration of delayed emptying time, and decreased mobility of individual calices, or the entire kidney pelvis; (3) Recurrence of pain after its temporary relief by means of physostigmine; (4) Evidence of generalized sympatheticotonia which is sometimes most marked on the side of the lesion; (5) Proved absence of an organic ureteral stricture; (6) Negative finding upon microscopic and cultural examination of the urine from that kidney.

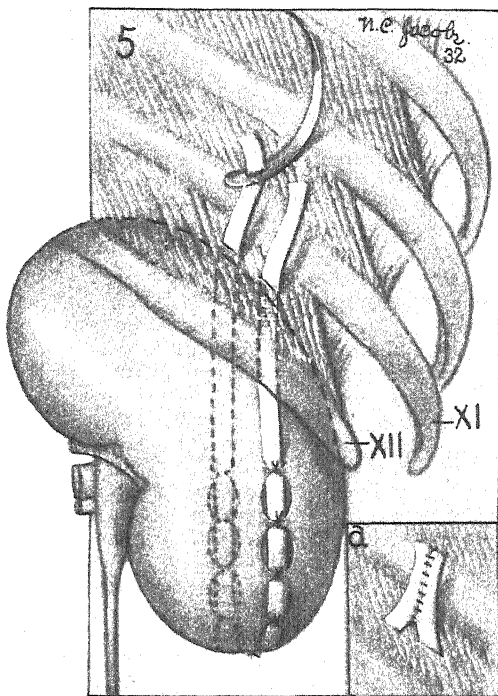


Fig. 70.—Free edges of fascia brought through intercostal muscles between 12th and 11th ribs. Inset *a* shows free ends of fascia sutured together with heavy silk. (By kind permission of the *Journal of the American Medical Association*.)

The operation of renal sympathectomy consists in carefully dissecting the individual vessels of the renal pedicle. Each vessel is completely denuded of connective tissue. While making the dissection it is advisable to dissect towards the kidney. The kidney pelvis and the upper part of the ureter are likewise stripped by most operators, but Hess (quoted by W. P. Herbst³⁰) confines his attention to the blood-vessels alone. The operation is extremely tedious and demands painstaking care (H. Harris³¹). In necessary cases it can be combined with nephropexy (W. P. Herbst). Renal sympathectomy is also on trial for a miscellaneous collection of other unsatisfactory conditions,

such as essential hæmaturia, but as yet there is insufficient data to formulate an opinion as to its value in these conditions.

Nephropexy by Means of a Fascial Hammock.—The hammock is made of a single strip of fascia lata. The excellent sketch (*Fig. 70*) of the operation makes the technique clear, and this appears to be an exceptionally good method of performing nephropexy and one by which the kidney will be kept in position permanently. (D. R. Mellin.³²)

Nephrostomy, particularly when performed by Cabot's method (*MEDICAL ANNUAL*, 1933, p. 253) is often a satisfactory and life-saving operation. It is usually required only as a temporary measure. M. L. Boyd³³ draws attention to the extraordinarily little inconvenience that a permanent nephrostomy can give. His patient had had nephrectomy performed some years previously. The ureter of the remaining kidney became blocked with stones and nephrostomy was performed. The patient wears the tube and bag shown in *Fig. 71*. The tube is kept in place by string around the waist. He has since married, and has carried on a successful business for eight years. His wife removes the tube every three weeks, boils, and replaces it. At night an additional piece of tubing is attached and led off to a receptacle beside the bed. Boyd emphasizes the fact that for successful permanent nephrostomy the skin opening and the kidney pelvis must be in a straight line; this is achieved by Cabot's method of performing the operation. The author suggests that permanent nephrostomy should be performed more often in carcinoma of the bladder, both in inoperable cases and as a preliminary measure before total cystectomy.

V. S. Counseller³⁴ states that an increased number of nephrostomies were performed at the Mayo Clinic during 1932.

Visualization of Renal Fistulæ.—It is sometimes desirable to have first-hand knowledge of the ramification of a renal fistula. This can be accomplished by a lipiodol injection prior to radiography. The tract should be irrigated with an antiseptic solution before the injection. The illustrations in a paper by L. Strauss³⁵ show that the course of the tract, as well as the extent of dilatation of the pelvis and calices, can be visualized by the method.

Pyelography in Injuries to the Kidney.—H. Rolnick³⁶ takes up the question of the value of pyelography in renal injuries. Pyelography does not supplant the necessity for clinical judgement in diagnosis and treatment of these injuries. It is of doubtful value in the early stages, for the injured organ temporarily ceases to function. Furthermore, gaseous distension of the intestines is often much in evidence after severe renal injuries; gas tends to obscure the pyelogram. The value of excretion pyelography reaches its zenith when applied to a case of apparently slight injury. Every patient who has had renal injury which apparently is healing should have pyelography before he is allowed to leave his bed (H. Bailey³⁷). With this precaution we are spared being taken unawares by late catastrophic hæmorrhages due to severe lacerations temporarily sealed by blood clot.

Aneurysm of the Renal Artery.—M. Gerrard³⁸ reports 19 cases, and has collected 49 cases from the literature. The majority of cases are found in old

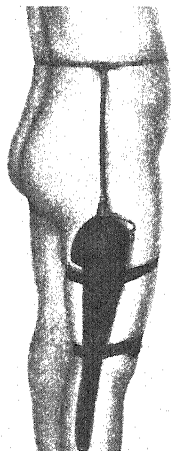


Fig. 71.—Permanent nephrostomy. The nephrostomy tube is kept in place by a string around the waist. (After M. L. Boyd.)

people with arteriosclerosis, and an X-ray examination usually shows a circular shadow outside the pelvis varying in size from a cherry to an orange. The principal danger is *rupture*. The symptoms of a ruptured aneurysm fall into three groups: (1) Profuse hæmaturia (one-third the cases); (2) Perirenal hæmatoma (one-half the cases); (3) Both (1) and (2). Testicular pain was present in two instances. Owing to the tendency to calcification, and the advanced age of the patient, surgical treatment of a non-ruptured aneurysm is rarely indicated. When rupture occurs operation is imperative. Five cases are reported where nephrectomy was performed, and two in which the sac alone was removed. All operations were followed by a cure.

Infarction of the Kidney.—J. D. Barney and E. R. Mintz³⁹ describe the case of a woman of 31. Following an attack of thrombophlebitis of the left leg she was admitted into Massachusetts General Hospital with severe pain in the left loin. After some days, a tentative diagnosis of perinephric abscess having been made, the left loin was explored under local anæsthesia. There was no abscess, but the kidney presented a curious lifeless appearance; it did not bleed when partially decapsulated nor when a small portion had been removed for microscopical examination. The pathological report on the specimen was returned as infarction of the kidney. Later the patient's condition again became serious, and still the symptoms pointed to the left loin. Operation was undertaken under gas and oxygen anæsthesia, and nephrectomy was performed. The excised kidney showed that the entire vascular pedicle, both arterial and venous, was blocked with clot. The patient died ten days later from pneumonia.

Five other cases of infarction of the kidney are described. All ended fatally. The authors remark that it is not the infarct *per se* that kills; it is rather the endocarditis, sepsis, or phlebitis (the cause of the infarcts) which determines the fatal issue.

Renal Calculus.—

The Relation of Fractures to Nephrolithiasis.—Skeletal fractures appear to predispose to renal calculi. From the medico-legal standpoint this is of obvious importance; take for instance F. Oehlecker's case.⁴⁰ The patient was a bricklayer, and he had a fractured lumbar vertebra. Four months later renal calculi developed. As there was plenty of radiological evidence that no calculi were present in the early days of the treatment of the fracture, a direct relationship between the accident and the development of stones must be allowed. In fracture of the spine the sequence is not difficult to follow. In such injuries the spinal cord is likely to be damaged, and in all such cases some degree of pyelitis is almost inevitable. When it comes to the fracture of a long bone the relationship between the accident and the stone formation is more difficult to understand. B. Schmuckler,⁴¹ who has been closely investigating this question, considers the important factor is absorption of calcium salts following the fracture.

Cystine Nephrolithiasis.—This should be suspected in all cases of recurrent renal calculi, and the calculi and urine should be examined chemically for cystine. In patients with this inborn error of metabolism recurrent calculi can be prevented to a large extent by a **Low-protein Diet**—proteins with a high cystine content being rigorously avoided; in addition, the urine should be rendered alkaline. In two of G. H. Ewell's⁴² patients, after two months upon such a diet, the urine became cystine free. The familial and hereditary characteristics of cystinuria are not always present, as proved by examination of the urines of other members of the family.

The Hazards of Nephrectomy.—A tear in the inferior vena cava is one of the most alarming accidents of renal surgery. It is an ever-present danger

while a difficult right-sided nephrectomy is in progress; dense adhesions, a short pedicle, and an obese patient are predisposing factors. J. B. Priestley and W. Walters⁴³ consider that a hæmostat applied accurately to the tear, but not occluding the vena cava, is the most satisfactory and practical method of dealing with the situation. The handles of the hæmostat are left projecting from the wound and the instrument is left in place for a whole week. The ratchet is then loosened, but the hæmostat is still left in place till the eighth day, when it can be removed in almost every case without further bleeding. The authors have had two successful cases by adopting this method.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1933, Feb., 445; ²*Ann. of Surg.* 1933, July, 92; ³*Brit. Med. Jour.* 1933, April 8, 606; ⁴*Minerva Med.* 1933, June 16, 879; ⁵*Arch. des Mal. des Reins et des Org. génito-urin.* 1932, vi, 595; ⁶*Lyon. chir.* 1931, Aug., 462; ⁷*Arch. f. klin. Chir.* 1933, May, 238; ⁸*Jour. Amer. Med. Assoc.* 1933, Jan. 28, 236; ⁹*Ann. of Surg.* 1932, Dec., 1028; ¹⁰*Proc. Mayo Clin.* 1933, May 17; ¹¹*Jour. of Urol.* 1932, Oct., 405; ¹²*Proc. Mayo Clin.* 1933, Feb., 128; ¹³*Surg. Gynecol. and Obst.* 1933, Jan., 110; ¹⁴*Brit. Jour. Urol.* 1933, June, 156; ¹⁵*Paris méd.* 1932, Aug., 133; ¹⁶*Lancet*, 1933, Feb. 11; ¹⁷*Med. Jour. of Australia*, 1933, Feb. 4; ¹⁸*Arch. ital. di Chir.* 1933, Feb., 241; ¹⁹*Rev. Espagnola di Cir.* 1932, May, 218; ²⁰*Brit. Med. Jour.* 1932, ii, 965; ²¹*Eddin. Med. Jour.* 1933, March, 116; ²²*Revista med. di Barcelona*, 1932, Dec., 533; ²³*Surg. Gynecol. and Obst.* 1932, Oct., 440; ²⁴*Calif. and Western Med.* 1932, Oct.; ²⁵*Newcastle Med. Jour.* 1932, Oct., 201; ²⁶*Jour. Amer. Med. Assoc.* 1932, Nov. 12, 1652; ²⁷*Practitioner*, 1932, Nov., 614; ²⁸*Med. Welt*, 1932, Dec. 3, 1754; ²⁹*Jour. of Urol.* 1924, April, 337; ³⁰*Jour. Amer. Med. Assoc.* 1932, Dec. 10, 2004; *Minnesota Med.* 1932, June, 413; ³¹*Brit. Jour. Urol.* 1930, 367; ³²*Jour. Amer. Med. Assoc.* 1933, April 15, 1167; ³³*Ibid.* 1932, Oct. 8, 1226; ³⁴*Proc. Mayo Clinic*, 1933, April, 287; ³⁵*Zeits. f. Urol Chir.* 1931, July, 321; ³⁶*Amer. Jour. Surg.* 1933, April, 40; ³⁷*Practitioner*, 1933, March, 342; ³⁸*Jour. d'Urol.* 1932, Nov., 353, Dec., 449; ³⁹*Jour. Amer. Med. Assoc.* 1933, Jan. 7, 1; ⁴⁰*Zentrab. f. Chir.* 1932, May 21; ⁴¹*Zeits. f. Chir.* 1931, Oct., 255; ⁴²*Jour. Amer. Med. Assoc.* 1932, Dec. 24, 2160; ⁴³*Proc. Mayo Clinic*, 1933, May, 302.

LABOUR. (See also MATERNAL MORTALITY AND MORBIDITY.)

LABOUR, INFLUENCE OF AGE UPON.

Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.

The influence which age may have on the course of pregnancy and labour has been given considerable prominence in American and Continental literature, and in Great Britain the subject has been recently investigated by Douglas Miller.¹ In a communication to the Edinburgh Obstetrical Society Miller analyses the results of 174 cases of pregnancy in young girls and of 88 cases in which the patient had passed the age of 40 at the time of her first confinement.

Pregnancy in Young Girls.—In this group the ages of the girls varied between 13 and 17, the majority naturally falling into the latter extreme. Pregnancy in most very young primiparæ proceeded normally to term and the incidence of premature labour was not appreciably different from that in older women. In about 10 per cent *albuminuria* or *syphilis* accounted for the onset of labour at or before the thirty-sixth week. Venereal disease was present in 28 cases (16 per cent); and *albuminuric toxæmia* also presented a high rate of incidence (17 cases, including 3 patients with eclampsia). The author attributes the frequency of toxæmia to the inevitable lack of supervision associated with illegitimate pregnancy rather than to the age of these young patients. In the case of the three eclamptics the patient had concealed her pregnancy and did not receive any medical attention until after convulsions had occurred. Miller notes that two of these patients died.

The *length of labour* in the author's series did not differ appreciably from that regarded as normal in a first labour, and in many cases the expulsion of the child was surprisingly rapid and easy. The *average weight of the babies* at birth was 6 lb. 4 oz. over the whole series, and a trifle below this figure in girls

of 15 years or less. One girl of 16 gave birth spontaneously to a child weighing 9 lb. 3 oz. after a labour lasting only eight hours!

In 16 cases the *pelvic measurements* were below normal, and 14 of these occurred in girls under 16 years of age. The pelvis was of the 'small round' type and undoubtedly represented an undeveloped rather than a pathological type. The incidence of *malpresentations* was neither greater nor less than in older women, and laceration of the soft parts occurred approximately in 1 patient in 6, a figure which compares very favourably with that associated with other ages. The frequency of *forceps delivery*, approximately 9 per cent, was low, and less than the average figure (10 per cent) for the operation in all cases at the Edinburgh Royal Maternity Hospital, where the author's investigation was conducted. Miller thinks it probable that, as ossification is incomplete and the mobility of the pelvic joints less restricted than in older women, the pelvis in young girls may be functionally more capacious than its measurements would indicate. *Cæsarean section* was performed in 4 patients, the indication in each case being contracted pelvis.

Miller's results do not support the view that the course of pregnancy and labour in the very young is attended with greater danger or difficulty than in the more mature patient, apart from the higher incidence of coexisting venereal disease, and the tendency to concealment of pregnancy, with deficient ante-natal supervision. Most of these patients are unmarried and of the hospital class, and therefore the most *suitable environment during pregnancy and labour* is an important consideration. The author advocates institutional treatment where the girl will be treated "neither as an injured innocent nor yet as a culprit, and at the same time be assured of adequate ante-natal care".

The Elderly Primipara.—When pregnancy occurs for the first time over the age of 40 there is no doubt, as Miller says, that the patient generally approaches her confinement with considerable anxiety, and that this is shared by her relatives and to some extent also by her medical attendant. This opinion is justified by the findings in the author's series of 88 primiparæ whose ages ranged from 40 to 47.

Pregnancy in these elderly primiparæ shows an undue *frequency of albuminuric toxæmia*. J. K. Quigley² gives an incidence of 15·5 per cent, W. C. W. Nixon³ 15 per cent, and M. Schulze⁴ 12·1 per cent. In D. Miller's series 10·7 per cent suffered from severe albuminuric toxæmia in spite of careful ante-natal supervision.

Regarding labour, much greater variation was noted in primiparæ over 40 than in younger women, especially in relation to the proportion of patients in whom labour exceeded the usual eighteen hours. The commonest cause of delay in the author's series lay in feeble and *inadequate uterine contractions*. The uterus of the elderly primipara is much less sensitive to stimuli which provoke contraction, and in those cases where labour was induced before term the response was unsatisfactory and labour seriously prolonged. The author thinks it probable that the *delay in dilatation of the cervix* common at the age of 40 and beyond is due to uterine inertia rather than to any constitutional rigidity associated with age. He thinks it rational therefore in cases in which vaginal delivery is contemplated, to attempt *sensitization of the uterus with quinine* several days before the probable onset of labour. Miller also considers that the *routine hospitalization* of the elderly primipara is desirable owing to the possibility of *lower uterine segment Cæsarean section* being required should uterine contractions prove to be inadequate. All published series of cases show a high incidence of Cæsarean section, varying from 11 per cent in the case of J. K. Quigley's² observations, to 17·3 per cent in the case of T. P. Maxwell and A. I. H. Wong,⁵ and 33 per cent with M. Schulze.⁴ In D. Miller's¹

PLATE XXXV

LARYNGOCELE

(SIR W. J. DE C. WHIPPLE)

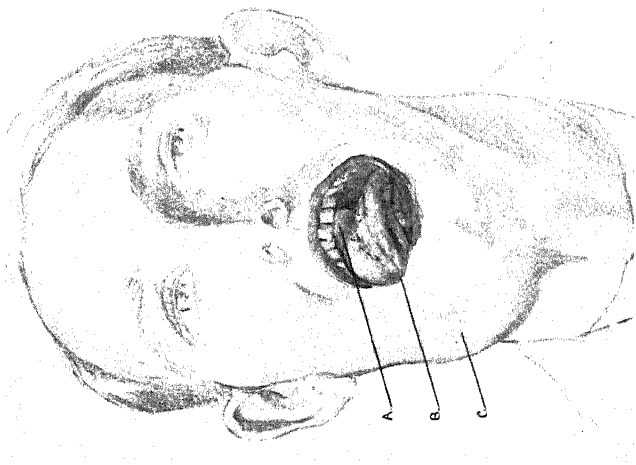


Fig. A



Fig. B

Fig. A.—Congenital laryngocele. A, Air-containing protrusion on the dorsum of the tongue; B, Tip of tongue deviated but could not be protruded; C, Communicating air-sac in the submaxillary region. Illustration was made from the patient before death.

Fig. B. Skingram of laryngocele, lateral view. The protrusion on the tongue was injected with 10 c.c. of lipiodol. Note the narrow connection between the lingual and submaxillary portions.

Plates XXXV, XXXVI, and Fig. 72 by kind permission of 'Surgery, Gynecology and Obstetrics'.

some of the higher apes. Professor A. F. Dixon, of Dublin, possesses another specimen from which the drawing (Fig. 72) has been made.

There is little doubt that the patient referred to was suffering from this congenital deformity. The appendix of the laryngeal ventricle on the right side had extended through the thyrohyoid membrane in an upward direction behind the body of the hyoid bone to the floor of the glosso-epiglottic fossa.

There is no mention in surgical literature of the extension of these extra-laryngeal pouches into the tongue. In the apes they extend down the neck, often as far as the clavicle or between the two heads of the great pectoral muscle into the axilla. They attain a very large size.

Von Bergman² mentions laryngocele and congenital air cysts in connection with swellings of the neck. He and other German writers refer to the danger of sudden death from suffocation when the sac becomes over-distended.

The fact that the lipiodol did not enter the larynx in the case under review may be explained on the hypothesis that the interior opening was either very minute or of a valvular nature.

Richard Quain³ states that the blind end of the appendix sometimes passes upward, lateral to the aryepiglottic fold and behind the body of the hyoid bone, so as to lie close to the floor of the glosso-epiglottic fossa. He refers to Slavunas, who collected reports of 10 cases of congenital laryngocele. Two were bilateral, 4 were unilateral, and 4 were bilateral but with a larger sac on one side.

Andre Forster,⁴ Professor of Medicine in Strasbourg, gives a very full illustrated account of the laryngeal sac in apes.

REFERENCES.—*Surg. Gynecol. and Obst.* 1933, Feb.; *System of Practical Surgery*, ii, 147; *Anatomy*, 1914, ii, pt. 2, 169; *Arch. d'Anat., d'Histol. et d'Embryol.* 1925, iv, 45.

LARYNX, TUBERCULOUS DISEASE OF.

F. W. Watkyn-Thomas, F.R.C.S.

DIAGNOSIS.—The importance of early diagnosis is emphasized by H. Barwell.¹ He remarks that early diagnosis is essential for successful treatment, and, as nearly all cases of tuberculous laryngitis are secondary to phthisis, all phthisical patients should have their larynxes inspected every few months as a routine measure. It must be remembered that many consumptives have a hoarse or a weak voice simply as a result of asthenia, and they are liable to

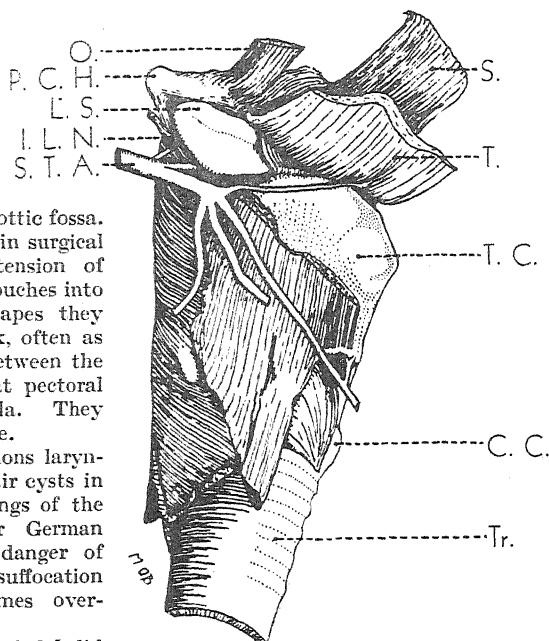


Fig. 72.—Congenital protrusion of a laryngeal pouch. Drawing from a specimen in Trinity College, Dublin, by kind permission of Professor A. F. Dixon.

simple laryngitis from the strain of coughing and from infection by secondary organisms in the sputum. On the other hand, a genuine tuberculous lesion may not cause any symptoms in the early stages and can only be excluded by laryngoscopy.

The usual *route* of invasion is by organisms in the sputum directly through the epithelium; the usual *place* is the vocal process, where the epithelium is thinnest, closely applied to the cartilage, and liable to abrasion by coughing. The earliest lesions are thus usually found at the level of the glottis and may spread forward along the cord or back to the commissure. Although the upper orifice is rarely attacked before the glottis, swelling of the arytenoid is often seen early; ulceration of the epiglottis is usually late.

The author points out that the 'characteristic pallor' of the tuberculous larynx is fictitious. The tuberculous granulations, the margins of the ulcers, and the arytenoid infiltrations are usually pale, but the pallor of the larynx depends on the anæmia of the patient; sometimes the larynx may be red from coughing, and infiltrations on the cords, bands, or epiglottis may be deeply congested. There is little fibrosis if the ulcers heal, unlike syphilis or lupus, and dyspnoea from scarring is very rare. Often the disease is detected in the larynx before it has been suspected in the lungs. In known tuberculous patients catarrhal laryngitis may be regarded as tuberculous, and if there is any suspicion it is wise to treat it as such; vocal rest and simple treatment will soon cure the catarrhal condition. If only one cord is affected, or if there are granulations or ulceration, the condition is not catarrhal. The syphilitic ulcer has a well-defined margin; if superficial it is surrounded by a zone of hyperæmia, with a smooth, flat base; if deep it is crater-like, with punched-out, undermined, and sometimes 'mouse-nibbled' edges. Roughly speaking, syphilis extends from in front backwards, tuberculosis from behind forwards. This is particularly noticeable on the vocal cords. Lupus spreads downwards from above and attacks the epiglottis and upper aperture first; it is painless, the infiltration is in nodules, and stenosis may be caused by the dense scar tissue.

A tuberculous infiltration limited to one cord, sometimes found in elderly men with very indefinite signs in the chest and scanty or absent tubercle bacilli, may easily be mistaken for carcinoma. Such cases must be examined very thoroughly with skiagrams of the chest. Biopsy is often impossible as the mass is too sessile. The author concludes "it is better to perform a laryngo-fissure for an infiltration which proves to be tuberculous than to allow an epithelioma to pass beyond the reach of removal by this operation".

TREATMENT.—H. P. Schlugt² describes a method of **Blocking the Pharyngeal Nerve Plexus** in those cases where laryngeal tuberculosis extends to the pharyngeal wall. He remarks that, when properly done, blocking the nerves of the pharyngeal mucosa gives permanent anæsthesia, but that the method is not so easy or safe as blocking the superior laryngeal. The nerve plexus for the pharyngeal wall lies in the parapharyngeal space and is made up of fibres from the vagus, glossopharyngeal, and sympathetic. A specially curved needle is pushed into the pharyngeal mucosa just behind the posterior pillar at the level of the base of the uvula and cautiously moved upwards and outwards for $1\frac{1}{2}$ cm. This must be done carefully to avoid injuring the neck muscles. When the space is reached the needle should be easily movable in all directions; if it is not, it means that the point is embedded in a muscle: $1\frac{1}{2}$ c.c. of dilute (35 per cent) **Alcohol** should be injected. At intervals of a few days increasingly strong doses should be given until anæsthesia is obtained. Too strong solutions may cause temporary, but complete, paralysis of the muscles of deglutition.

Sir J. Dundas-Grant³ makes some simple and most useful suggestions for the relief of pain in laryngeal tuberculosis. He points out that a sudden attack of pain on swallowing in these cases may be due to an ordinary tonsillitis, not to a pharyngeal spread, and may pass off in a few days. One common kind of pain is a 'painful burning stiffness' which is due to drying of mucus on the posterior pharyngeal wall. It is felt most on waking and causes such discomfort that often more serious sources of pain are suspected and the real cause overlooked. The simple treatment by means of a thermos flask with a solution of **Bicarbonate of Soda**, ready for warm gargling as soon as the patient wakes, offers a satisfactory remedy!

The other point is, admittedly, more a matter for the expert. The 'typical tearing pain' is nearly always caused by a spot of ulceration, and, if this spot can be found, destruction of the exposed nerve-endings by **Galvano-cautery** usually gives immediate relief. Sometimes when the ulceration is slight the spot can be found at once; unfortunately, if the ulceration is extensive there may be one sensitive spot which it is easy to miss. To avoid this mistake we are advised to test the whole larynx with a cotton-wool-coated probe until the actual sensitive spot can be found. Then that spot can be anaesthetized with cocaine and punctured with the fine point of a galvano-cautery.

J. Rozier, W. Jullien, and H. Mollard⁴ describe their experiences of a series of cases of laryngo-pulmonary tuberculosis treated with **Gold Salts**. Their patients, thirty-eight in all, were treated with mineral salts of gold (sanochrysine-crisalbine) and organic salts (allochrysine and oily solganal B).

It has been said that the association of a tuberculous laryngitis with phthisis makes gold treatment particularly dangerous. In one case, but only one, was the condition aggravated, and in this case there was definite 'reactivation' of the laryngeal lesions, but this patient's general condition was so bad that the authors do not regard it as a fair 'test case'. In four other patients—and it is a curious point that at the start none of them showed signs of anything except catarrhal laryngitis—ulcerations of the vocal cords and ventricular bands appeared during the course of treatment. These are regarded as focal reactions, and cleared up quickly and completely without interrupting either the treatment or the cure of the larynx as a whole. The risks and complications incidental to all forms of gold treatment do not seem to be at all increased by the presence of laryngitis, and the authors agree with Mayoux, Ameuille, and Hinault, who have categorically stated that even extensive laryngeal lesions do not, of themselves, contra-indicate the use of gold salts.

The next question is whether the gold salts actually benefit tuberculous laryngitis. The authors report, in their 38 cases, 14 complete laryngeal cures, 12 cases in which there was considerable improvement, 11 in which the condition was unchanged, and 1 in which it was aggravated. The period of observation for all cases was from three to six months. Of the 14 cured cases—and for cure nothing less than *restitutio ad integrum* is accepted—6 were catarrhal, 2 were simple infiltrations, and the other 6 were infiltrations with ulceration. Of all cases those with infiltration and oedema seem to have been most resistant. They remained stationary, with slight and temporary periods of improvement, but were never cured.

The extent of the pulmonary lesions affect the results of laryngeal treatment; there seems no doubt that the more diffuse the lesions in the lungs the less likely are gold salts to improve the laryngeal condition. On the whole, improvement in the lung and the larynx progress together, but there are exceptions; in several cases the lung condition greatly improved while the larynx remained unaltered, in others the larynx was cured while the lesions of the lungs showed no improvement at all.

Sir StClair Thomson,⁵ writing on tuberculosis of the larynx and **Artificial Sunlight Treatment**, comments on a series of 32 cases treated at Midhurst during three years, 1926-29. It had been claimed for light treatment that 55 per cent of cases of laryngeal tuberculosis could be cured by this method, but in ten years at Midhurst the total cures were only 25 per cent. The results have been most disappointing. All the 32 chosen cases were well 'within the expectation of cure' by the usual methods, with early and limited disease, usually in the inter-arytenoid region, or on the cords or ventricular bands. In only two or three cases was there any improvement which could fairly be attributed to the light. In several cases the light was abandoned owing to pyrexia; in several other cases (11 in all) the galvano-cautery was needed before a cure could be obtained; in 4 a pneumothorax was made. The author's conclusion is that "while it may appear to be of help in a very few cases, it probably acts only by suggestion; that it is fraught with danger if not scrupulously supervised; and that, on the whole, in patients in a well-ordered sanatorium it is no addition to the treatment at present in use".

On the other hand, A. Eidinow,⁶ in a paper on treatment of chronic inflammatory diseases of the mouth, pharynx, and larynx by local application of **Ultra-violet Rays**, is far more hopeful. He has designed a small water-cooled quartz mercury-vapour lamp for the direct application of ultra-violet rays to the buccal and pharyngeal mucous membranes. The lamp is fully described in his paper. It is worked with a current of 80 to 100 volts and one ampère, giving rays of 8000 to 2300 A.U. wave-length. The method must be used with great care, as otherwise there may be a severe and acute reaction. *Sub-acute glossitis, chronic catarrhal pharyngitis, and leucoplakia* all responded in an encouraging way, but in cases of leucoplakia any suspicion of early malignant disease seems to be a definite contra-indication. The most important observations are those described in the treatment of tuberculous lesions. Three cases of chronic tuberculous ulcerations of the palate and tongue were treated, and all three were cured; it must be noted, however, that in all three the pulmonary lesions were cured before the light treatment was begun. Eight cases of laryngeal tuberculosis were treated, with six complete successes. In the other two patients, both of whom died, there was temporary alleviation of pain. It is clear, however, that the method must be used with great discretion and always by the expert.

A. I. Cemach⁷ also describes a method of local application of ultra-violet rays by a special instrument. He has invented a small, curved quartz lamp which can be passed into the larynx. He agrees that *general* irradiation with artificial sunlight cannot be expected to cure tuberculous laryngitis, as even the Alpine sunlight cannot do this, but the *local* application of light can and does. Local light therapy is an adjunct to sanatorium treatment, it cannot replace it. On the other hand, this treatment is valuable for cases which are unsuitable for cauterization. Cemach believes that **Cauterization** should be reserved for infiltrations, especially those which are torpid, inclined to calcify, and therefore resistant to light. It is in the treatment of ulcerated lesions that he has found his method most useful. When the destruction has been inhibited by radiation he deals with infiltration by the cautery. He believes that the technique of his irradiation method is so simple that no special laryngological experience is needed. This seems to be entirely at variance with the other authors whom we have quoted on this point.

R. W. Wilkinson's⁸ conclusions from a careful review of a series of 45 cases may be summarized thus: (1) In many or even in the majority of early cases of tuberculous laryngitis the results are encouraging; (2) Every general

practitioner should realize that every patient with phthisis must be examined with the laryngoscope at frequent intervals—it is wrong to wait for laryngeal symptoms; (3) Treatment is carried out best at a sanatorium; (4) The most effective method of treatment is a suitably adapted combination of electro-cauterization, vocal rest, and sunlight or modified sunlight. The best single method known at present is cauterization. Vocal rest is of supreme importance, and heliotherapy is very valuable when carried out under careful supervision.

SUMMARY.—These papers may be regarded, on the whole, as distinctly encouraging. Two points of the utmost importance are clear: first, that tuberculous laryngitis is by no means a hopeless condition; next, that diagnosis must be made early, and early diagnosis depends on examination appearances, not on symptoms. Although general irradiation with artificial sunlight has proved disappointing there seem good grounds for hope that local application may yet be helpful. Lastly, there is some definite evidence that the gold salt treatment may actually help the cure of the condition.

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LEATHER-BOTTLE STOMACH.

Robert Hutchison, M.D., F.R.C.P.

This subject was dealt with in the MEDICAL ANNUAL for 1933 (p. 264), but since then C. P. Howard¹ has published an account of ten other cases with a very full review of the literature. He uses the term 'linitis plastica' for the condition, but gives a list of no fewer than forty-two synonyms for it. He has no doubt that the majority of cases belong to the sclerosing type of carcinoma. He is not prepared to deny the existence of a benign form (so-called 'fibromatosis'), but believes that if many of the reported cases of this type had been more carefully examined they would have proved to be malignant. He suggests also that in many supposed syphilitic cases of leather-bottle stomach there has been a secondary invasion by cancer cells.

REFERENCE.—¹*Quart. Jour. Med.* 1933, Jan., 59.

LEISHMANIASIS. (See KALA-AZAR; ORIENTAL SORE.)

LEPROSY.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY AND PROPHYLAXIS.—The results of three and a half years of leprosy surveys in India are summarized by E. Muir and I. Santra,¹ during which 16,499 cases were found among 2,435,610 persons examined, or 0.7 per cent, being over four times as many as had been returned in the census of 1921, the figures of which only include obvious advanced cases. High incidence has been found among aboriginal people in labour forces in contact with civilization, and markets and pilgrimages spread the disease, which is predisposed to by deficient diet and debilitating diseases.

E. Muir and J. Lowe² review prophylactic measures in India, and they emphasize the fact that the disease can easily be diagnosed before the patient has become infective, when most cases recover under continued efficient treatment. In the Madras Presidency special leprosy officers are now seeking out and treating such early cases at eighty clinics, and the Annual Report for 1932 of the Indian Council of the British Empire Leprosy Relief Association shows that some 150,000 lepers are now being treated in India at 213 clinics at the very low cost per head per annum of about 5s. in Madras. The fifty-nine

residential institutions also accommodate 9634 inmates. Endeavours are now being made to extend the preventive work of the clinics by visiting the homes of the lepers and giving instruction with regard to precautionary measures to prevent infection, especially of the susceptible children, as well as to find early contact cases for treatment. J. Lowe³ also reports on the epidemiology of leprosy in the Deccan, India, where he worked for some years. His conclusions are in accordance with general experience, and he lays stress on the frequency of house infections and in persons under twenty, although symptoms may appear later in life owing to a long latent period, and their rarity under conjugal conditions in adults.

The fate of children born of leprous parents in the leper asylum of Surinam is reported on by P. H. J. Lampe,⁴ who found the fertility of female lepers to be high, but 40 per cent of their children die, mainly in the first year of life, and especially when the mothers give a positive Wasserman reaction not due to leprosy itself. Of those surviving the first year of life, 26 per cent became lepers and showed symptoms between the second and ninth years of life, and the incubation period among children showing little resistance is about two years. As there are lepers in Surinam over 80 years of age who have been born in and always lived in asylums, the necessity of separating the children from their mothers at birth, as now enforced in Surinam, is evident.

PATHOLOGY.—An important advance is recorded by M. H. Soule and E. B. McKinley,⁵ who report further on the cultivation of the *Mycobacterium lepræ*—that they have carried their cultures recorded in last year's MEDICAL ANNUAL (p. 264) to sixteen generations in eighteen months. Moreover, E. B. McKinley and Elizabeth Verder⁶ have continued this work, and found that by planting out their colonies in an embryonic tissue culture, made from minced embryo chick suspended in Tyrode's solution, growth was obtained in five days under CO₂ and oxygen tension and also under ordinary atmospheric conditions, and they are able to cultivate the strain apparently indefinitely by this means, as it has now remained viable for two years. They have also made cultures thus directly from the nodules of three cases of leprosy, so they believe that Hansen's bacillus may now be readily grown.

The calcium content of the blood serum of lepers has been studied by A. G. Badenoch and F. E. Byron,⁷ who found it was always reduced below the normal during lepra reactions, and to a less extent in their absence, and that an increase of serum calcium appeared to be correlated with clinical improvement, as a rise due to the addition of calcium-containing milk was usually accompanied by clinical improvement.

TREATMENT.—In the small island of Rodriguez, near Mauritius, leprosy has long been known, and J. B. Kirk and J. H. Andre⁸ report that to the 46 cases discovered up to 1926 a recent survey added 20 further lepers, and that the patients are now convinced of the value of treatment and co-operate in measures to help them. G. A. Ryrie⁹ reports on the intravenous injection of solutions of certain dyes in leprosy of which he has tried a large number, and found that the following produced selective staining of the leprous lesions with good results in the form of a definite diminution of the external lesions of a variable degree without any immediate reactions, but the writer makes it clear that it is too soon to say if the improvement will be permanent. The successful dyes used were 25 c.c. of a 4 per cent solution of **Trypan Blue**, 15 to 20 c.c. of a 1 per cent solution of **Brilliant Green**, and 10 c.c. of a 2 per cent solution of **Fluorescein**, the last two also having been used in combination, with marked retrogression of the lesions in 50 per cent of the cases in an average of nine weeks, while 4 out of 12 cases became

bacteriologically negative. P. D. Strachan¹⁰ lays stress on the importance of favourable conditions of diet, hygiene, exercise, and treatment of concurrent diseases if good results are to be obtained in leprosy.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1932, Oct., 421; ²*Ind. Med. Gaz.* 1933, Feb., 88; ³*Internat. Jour. of Leprosy*, 1933, Jan., i, 17; ⁴*Ibid.* 5; ⁵*Amer. Jour. Trop. Med.* 1932, Nov., 441; ⁶*Proc. Soc. Exper. Biol. and Med.* 1933, Feb., 659; ⁷*Trans. Roy. Soc. Trop. Med. and Hyg.* 1932, Nov. 11, 253; ⁸*Ibid.* 1933, March 23, 499; ⁹*Ibid.* June 29, 33; ¹⁰*S. African Med. Jour.* 1933, April 8, 210.

LINITIS PLASTICA. (See LEATHER-BOTTLE STOMACH.)

LIPOID METABOLISM, DISEASES OF.

Stanley Davidson, M.D., F.R.C.P.E.

For a full description of the classification, pathology, and clinical manifestations of this extremely interesting group of diseases, the reader is referred to the recently published papers by Professor Ludwig Pick.¹

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1933, April, 453, May, 601.

LIVER, SURGICAL DISEASES OF. *A. Rendle Short, M.D., F.R.C.S.*

Ruptured Liver.—D. Ecarius,¹ of Berlin, relating three cases, mentions that severe hæmorrhage from the torn liver may be controlled by clamping the hepatic artery and portal vein in front of the foramen of Winslow, but the clamp must only be left on a very short time. He quotes a large body of central European statistics as to the mortality:—

Edler	..	189 cases,	85	per cent	died
Thöle	..	260	61.54	"	"
Reichle	..	20	55	"	"
Schmidt	..	24	66	"	"
Wyss	..	17	58	"	"
Just	..	10	50	"	"

R. F. Carter,² of New York, happened to tear a hole in the liver with a retractor during an operation, and found that filling it tightly with a chunk of rectus muscle and applying pressure effectually stopped the rather free bleeding.

Liver Abscess.—About one hundred cases, from New Orleans, rather more than half of which were amœbic and the rest bacterial, are reviewed by H. B. Gessner.³ Of these 39.6 per cent died. The commonest method of treatment was **Incision of the Abscess**, after adhesions were made sure of, and packing the cavity tight with **Iodoform Gauze** soaked in **Balsam of Peru** and **Castor Oil** (23 cases, 5 died). Next most popular was incision and drainage (17 cases, 5 died).

Vergoz and Hermenjat-Gerin,⁴ of Algiers, write on rupture of the amœbic abscess of the liver into the serous cavities, describing 3 cases at their own clinic (2 cured, 1 fatal) and 80 from the literature, mostly French and North African. Intraperitoneal rupture is the commonest and the least disastrous; 46 per cent died. Intrapleural rupture was fatal in 85.7 per cent of cases, and intrapericardial in all. When the pus bursts into the peritoneum it may form a localized abscess, or cause general peritonitis, the symptoms being like those of localized or diffuse peritonitis from other causes. Diagnosis is seldom made before operation. Treatment is to open and drain the abscess cavity, but if the pus is examined immediately and found to be sterile, it is wise and safe to close the abdomen completely. A course of **Arsenic** and **Emetine** should follow. Intrapericardial rupture is usually fatal on the spot.

Hydatid Cyst.—The value of laboratory investigations in the diagnosis of hydatid infestation is reported on by K. D. Fairley and C. H. Kellaway,⁵ of Melbourne. Half the patients show eosinophilia. A complement-fixation test

positive before the first operation is definite evidence of hydatid disease, and it is of great value for the diagnosis of recurrent or residual cysts after operation, but failure to react to the test does not exclude the presence of hydatids. The Casoni test—i.e., the intradermal injection of hydatid fluid derived from the sheep—shows enlargement of the wheal and an erythematous zone around it within half an hour if hydatids are present, but the test is useless after operation. If the test is negative, there is a 93 per cent probability that hydatid infection is not present, but it is only positive in 75 per cent of the genuine hydatid cases. There is a delayed reaction, an erythema seen about twenty-four hours after injection, which has much the same value. E. Bressot,⁶ of Constantine, Algeria, agrees that eosinophilia is present in half the cases, and that the Casoni test is positive in 58 per cent of patients with hydatid disease.

Five cases of hydatid cysts bursting into the bile-passages and causing jaundice and pain like biliary colic, all from Algeria, are related by three French surgeons, S. Sabadini, E. Bressot, and G. Sicard.⁷ All recovered after operation. The cyst was marsupialized. In two of Bressot's cases the first operation was to open the common duct, which contained hydatid cysts; it was necessary to operate again later to marsupialize the main hydatid cyst.

REFERENCES.—¹*Arch. f. klin. Chir.* 1933, Jan., 756; ²*Ann. of Surg.* 1933, April, 636; ³*Amer. Jour. Surg.* 1933, June, 672; ⁴*Rev. de Chir.* 1932, Nov., 680; ⁵*Austral. and N.Z. Jour. of Surg.* 1933, Jan., 236; ⁶*Presse méd.* 1932, March, 478; ⁷*Bull. et Mém. Soc. nat. de Chir.* 1932, July, 1115.

LUNG, ABSCESS OF.

J. F. Gaskell, M.A., M.D., F.R.C.P.

TREATMENT.—The medical and surgical treatment of abscess of the lung was discussed at the French annual congress of medicine.¹ E. Sergent and R. Kourilsky from the medical side emphasized the frequency of spontaneous cure, but at the same time the difficulty of being certain of this. False 'cures' occur. Surgical intervention is indicated in every case in which the condition lasts for two months without much improvement. A. Baumgartner, from the surgical side, also emphasized the necessity of fairly early surgical intervention for success, and considered two months the best time to operate. He stated that the use of the thermocautery or the electrical bistoury were the only reasonable operative procedures, and advocated either **Pneumotomy** or atypical fragmentary progressive **Pneumectomy**, according to the nature of the case. Lobectomy is rarely indicated and too dangerous. A. Lemierre, M. Leon-Kindberg, and A. Soulas advocated **Bronchoscopic Drainage** by suction at stated intervals. A. J. Scott Pinchin and H. V. Morlock² also give good results from the latter method in abscess, and marked amelioration in bronchiectasis. A. Landau and S. Kaminer³ advocate intravenous injections of 33 per cent **Alcohol**, rising from 20 to 50 c.c., in all suppurative lung infections.

REFERENCES.—¹*Presse méd.* 1932, Oct. 22, 1593; ²*Lancet*, 1932, ii, 605; ³*Presse méd.* 1932, Aug. 10, 1240.

A. Tudor Edwards, M.Ch., F.R.C.S.

The treatment of pulmonary abscess is settling down on more definite lines as experience accumulates. There is general agreement that, except in the gangrenous type, medical measures, including **Postural Drainage**, the administration of **Arsenic**, etc., should be instituted as the preliminary. Soon after the abscess ruptures into the bronchus it will be essential to determine whether **Bronchoscopic Aspiration** is advisable. There is no question that if this is carried out in every case a certain proportion of patients will be submitted to the procedure who would recover without any operative treatment. If,

however, there is inadequate improvement both clinically and radiologically after the end of the third week, bronchoscopic aspiration will be advisable. In the cases of radiologically proved hilar abscesses this method of treatment should be persevered with, but in other varieties unless there is a definite indication of cure by persistence of bronchoscopic methods, the question of surgical drainage should be seriously considered about the sixth to the eighth week.

Some authorities, such as Terracol,¹ state that only acute or subacute abscesses with clear cavity containing anaerobic organisms and little surrounding thickening are suitable for bronchoscopic treatment. **Surgical Drainage** should be instituted earlier in acute lung abscess if the size of the abscess increases, or if the clinical course suggests that a spontaneous cure is unlikely. This is the opinion expressed by H. Neuhoef and H. Wessler,² who further state that external drainage should always be performed for the subacute abscess. They record a series of 20 patients with acute lung abscess; 10 of these whose clinical course was favourable were not operated upon and recovered, but 1 with an acute fulminating lesion died. The remaining 9 were operated upon, and 8 of these recovered and 1 died. Of 8 patients with subacute abscess, 2 with favourable course recovered without operation; 6 were submitted to operation, of whom 3 recovered. In 34 cases of chronic abscess, 13 were not operated upon. The results of medical treatment in these were that 3 showed improvement, 4 were unchanged, and 6 died. Of the 21 submitted to operation, 12 were cured, 2 were improved, and 7 died.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1933, Feb., 98; ²*Ibid.* 1932, Dec., 523.

LUNG, CARCINOMA OF.

J. F. Gaskell, M.A., M.D., F.R.C.P.

The value of bronchoscopy in diagnosis is shown by H. V. Morlock and A. J. Scott Pinchin.¹

Primary stenosing carcinoma of the chief bronchi is described by M. Chiray, G. Albot, and R. Jame.² It is a very localized form, leading to collapse of the lung and often subacute bronchopneumonia. It is usually of prickle-cell type.

A. Costedoat³ writes of the eighteenth case in the literature of a lymphatic form of secondary carcinoma giving rise to suffocative symptoms like an acute tuberculous asphyxia. The primary growth is gastric, occurring in young people. The radiograph shows a characteristic dense lattice work.

H. K. Pancoast⁴ describes 7 cases of 'superior primary sulcus tumour' with diagnostic circumscribed X-ray shadow, and with symptoms of pain in the shoulder and arm, and Horner's syndrome showing sympathetic involvement. The tumour is of the prickle-cell type and is not primary in the lungs. It may arise from an embryonic rest.

REFERENCES.—¹*Brit. Med. Jour.* 1933, i, 911; ²*Presse méd.* 1933, July 5, 1057; ³*Ibid.* May 10, 745; ⁴*Jour. Amer. Med. Assoc.* 1932, Oct. 22, 1391.

A. Tudor Edwards, M.Ch., F.R.C.S.

More routine radiological examination in chest disease is leading to the diagnosis of malignant disease at an earlier stage than formerly. This is of considerable importance, as the possibilities of radical extirpation largely depend upon early diagnosis. Necessarily, since the majority of these growths arise primarily in the main bronchi, only a relatively small proportion will be suitable for radical operative treatment. Those types arising in the smaller bronchi and bronchioles cause characteristic shadows on radiological examination, being often rounded, and, apart from clinical symptoms, can be differentiated from infective conditions such as pulmonary abscess by the complete absence of evidence of inflammation in the surrounding lung. In other words,

there is an abrupt transition from the shadow to the normal translucent surrounding lung, whereas in pulmonary abscess there is a steady gradation of the shadow as it fades away into the normal tissue.

E. D. Churchill¹ reports four cases of carcinoma of the lung in which exploratory thoracotomy was performed. In two of these the growth was found to be inoperable. In the third right lower lobectomy was performed, but unfortunately the patient died on the third day from bronchopneumonia. The fourth patient had an operable growth involving the right middle and lower lobes, both of which were removed, and the patient made an uneventful recovery. In Churchill's view every patient with hæmoptysis, bronchial obstruction, or pleural effusion should be most carefully examined to exclude carcinoma of the lung.

REFERENCE.—¹*Jour. of Thor. Surg.* 1933, ii, 254.

LUNG, INJURIES OF.

A. Tudor Edwards, M.Ch., F.R.C.S.

During the course of the War there were considerable changes in the treatment advocated for wounds of the chest, and particularly in the early treatment of cases with open pneumothorax—'blowing wounds'. These were closed at the earliest possible moment regardless of the surgical amenities available, and this doubtless saved a large number of patients who could never have otherwise survived transportation to operating centres. Similar cases are not often encountered in civil life except in industrial areas, but knowledge of the types of accident in which early, if not immediate, operation is advisable should be widespread. These chest injuries appear to be more common in the United States than in this country and on the Continent, and from time to time papers are published which well merit careful reading. Thus A. L. Lockwood¹ advises early operation in all patients with open pneumothorax; in every case of 'stove-in' chest where the pleura is lacerated, with or without external wound; and in all patients with a penetrating wound in whom there is an irregular missile retained. Likewise, penetrating wounds with progressive bleeding, hæmoptysis, and massive pneumothorax, or with massive hæmothorax which cannot be controlled by aspiration, will require operation within a short time of injury. He also suggests that patients with rupture of the main bronchi and where damage to the hilum is suspected should be operated upon, but patients with such severe injury are unlikely to survive sufficiently long to reach hospital for the performance of any operation. A later indication, which is of course widely recognized, is the onset of sepsis in the lung or pleura whether or not any missile is retained.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1933, Feb., 542.

LUNG, MASSIVE COLLAPSE OF. J. F. Gaskell, M.A., M.D., F.R.C.P.

K. Middeldorp,¹ in an extensive clinical and experimental study, supports the theory of the plugging of a main bronchus as the cause of the condition. Division of the vagus or cocaineization of the bronchial mucous membrane prevents the asphyxial changes in breathing and circulation that massive collapse causes. These are therefore reflex.

REFERENCE.—¹*Deut. Zeits. f. Chir.* 1933, April, 173.

LUNG, PHYSICAL SIGNS IN. J. F. Gaskell, M.A., M.D., F.R.C.P.

Abnormal physical signs in the chest following surgical operations have been studied by R. H. Overholt and J. R. Veal.¹ They are due to fixation of the diaphragm in the expiratory position with consequent over-ventilation of the upper chest and collapse of the lower lobes. Even bronchial breathing may occur from the first to the fourth day, from this cause alone.

G. Renosto² draws attention to the occurrence through respiratory insufficiency of *râles at the apex of the lung*, which are purely functional, and not the sign of disease.

E. Korol³ gives a review of *paradoxical breathing*—the lungs filling on expiration, emptying on inspiration—in the animal kingdom. In man it is normal at the apex of the lung, in the root portion, and in the mediastinum. It implies a flow of air from one part of the lung to the other, and may be a cause of both emphysema and the spread of infections.

REFERENCES.—¹*New Eng. Jour. Med.* 1933, Feb. 2, 242; ²*Policlinico* (Sez. Prat.), 1933, Feb. 6, 212; ³*Arch. of Internal Med.* 1933, Feb., 264.

LUPUS ERYTHEMATOSUS. (Plate XXXVII.)

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

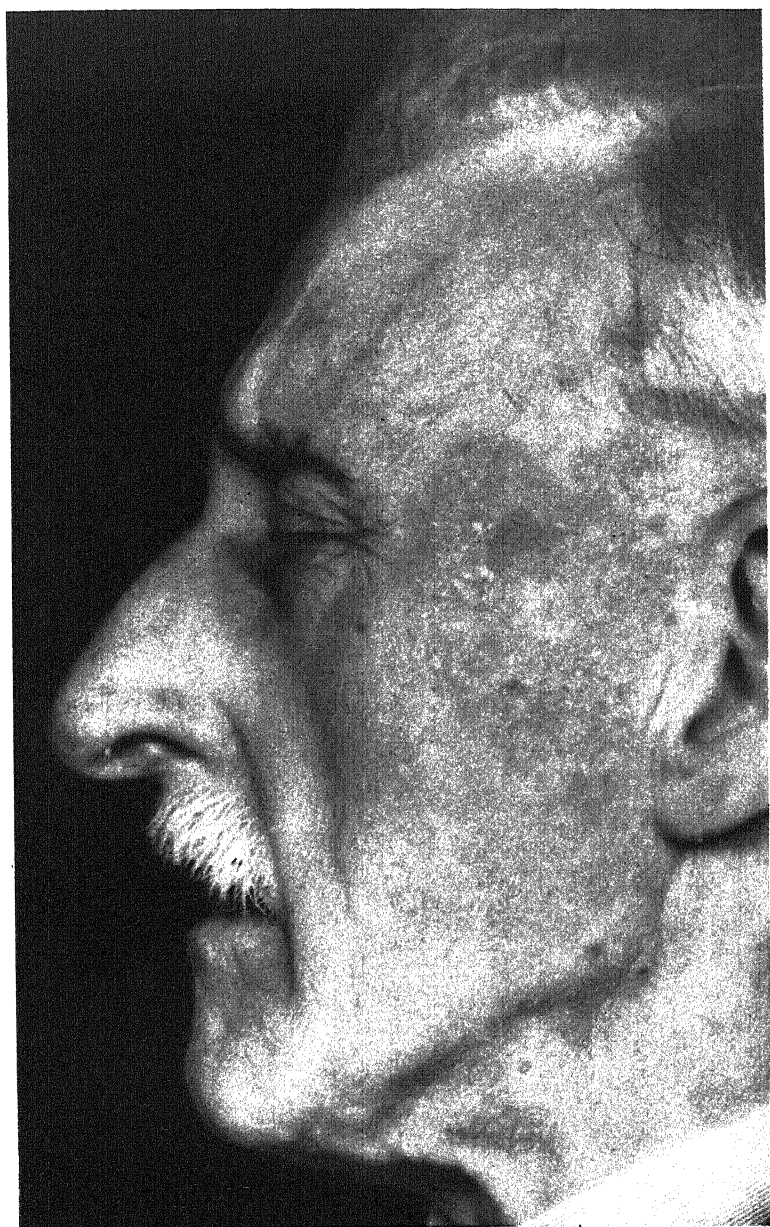
F. A. Diasco¹ looks upon lupus erythematosus as a disease in which the etiological factors are multiple and diversified. Some cases are probably tuberculous, while others exhibit no clinical evidence of tuberculosis but do show infection with other organisms, notably in the teeth and tonsils. The cases in which the skin is quickly overwhelmed with virulent material and which frequently end in death appear to be due to a tuberculous infection of the abdominal lymph nodes combined symbiotically with a focus of infection elsewhere due to one of the pyrogenic organisms.

Successful treatment necessitates a complete examination of the patient. Elimination of all offending foci of infection is indicated. All sources of local injury (light, wind, cold, heat, etc.) which might be responsible for an outbreak should be avoided. Tuberculin injections should not be given as they may aggravate the disease. Tonic measures, proper rest, regulation of the bowels, and nutritional therapy are valuable constitutional aids. He considers the **Gerson Diet** of value in this condition.

As to local measures, treatment by radium, X rays, and ultra-violet light is contra-indicated. **Carbon-dioxide Snow** is valuable in skilled hands. **Scarification** and painting with **Trichloroacetic Acid** have also their uses. Great advances in the treatment of this condition have occurred since the introduction of chemotherapy. The author has had good results with **Gold Injections**. He has used the sodium gold thiosulphate, introduced into the United States by Schamberg, but points out that in spite of the utmost care a number of toxic reactions occur which are beyond any means of control now at our disposal. Even the use of very small doses at the commencement of treatment will not eliminate the occasional case of extreme idiosyncrasy. Contra-indications to gold therapy are: (1) Acute febrile types of lupus erythematosus; (2) Organic disease or lowered functional activity of the kidneys, liver, or spleen; (3) Presence of active tuberculosis elsewhere in the body; (4) Loss of weight, asthenia, or other evidence of lack of good health and lowering of the natural power of resistance; (5) The appearance of gold reactions. A careful systemic examination of the patient is therefore necessary before embarking on a course of gold treatment. The author usually commences his treatment with intravenous injections of 0.01 gm. of the salt dissolved in 2 c.c. of distilled water, though in some cases only 0.002 to 0.003 gm. is given. Injections are given twice weekly at same strength for four doses, and then the dose is gradually increased up to 0.05 gm. twice weekly. This dose is not exceeded, but is continued as long as improvement continues. The author considers that as many as 200 to 300 injections may be given as long as the patient shows no untoward symptoms. [In this country it is usual to begin with smaller doses, in the neighbourhood of 0.001 gm., and to give injections not more frequently than once a week.—A. M. H. G.]

PLATE XXXVII—LUPUS ERYTHEMATOSUS

(HENRY C. SEMON AND ARNOLD MORITZ)



*By kind permission of
Dr. Henry C. Semon and Dr. Arnold Moritz*

The author has also tried bismuth therapy, as suggested by MacKenna, but only in cases which did not respond favourably to gold. He gives intramuscular injections of 1 c.c. ampoules of **Bismocymol** every three days for twenty doses. If signs of improvement occur, another course is given after two weeks' rest. In the few cases in which this treatment was tried, promising results were obtained. He has had no toxic effects with bismuth injections, but notes that these have been recorded when the drug is used for treating syphilitic cases.

R. Volk,² taking into consideration the success that has followed treatment by salvarsan and neosalvarsan in cases of lupus erythematosus, has treated a number of patients with **Spirocid**, a pentavalent preparation of arsenic similar to stovarsol. The patients were usually given one tablet of 0.25 gm. daily for three days, though in the more acute forms only half a tablet was given, then after three days rest either this was repeated or increased to 1.1.2., 1.2.2., or 2.2.2. tablets over the next three days. This is continued with three-day intervals. The author found an average case required 50 to 70 tablets to obtain healing, while a very resistant case required as many as 130 tablets. In a subacute case the lesions had disappeared after 12 tablets. If the healing process appears to have ceased, an interval of a week or two is given. The longest period occupied by the treatment in the author's series was 21 weeks.

Local reactions—swelling of the patches and an acute inflammatory erythema of the surrounding areas—are observed in some cases and the dose must accordingly be regulated to avoid getting severe reactions. No severe general reactions were observed, though slight gastro-intestinal disturbance, tinnitus, and vertigo, which quickly subsided when the dose was reduced, were met with in three cases. In 44 cases, 16 were completely healed and 19 much improved; in 4 cases the lesions flattened down but resisted further treatment by spirocid; 2 cases reacted so strongly to minute doses that the treatment was abandoned; and 3 other cases remained uninfluenced. The author has not had success with the acute type of case, but these were only tried with very small doses.

Volk has also tried bismuth therapy (injections of **Bismogenol**, 1 c.c. twice weekly) in cases which have resisted gold preparations or spirocid, and has seen the lesions subside without any reaction.

Acute Lupus Erythematosus.—A. C. Roxburgh³ describes five fatal cases of acute disseminated lupus erythematosus. He concludes that it is a very uncommon disease, which occurs most frequently in women, and between the ages of 20 and 30 years. Most cases begin as the chronic localized type, but there is no evidence to show why they change to the acute disseminated type. Arthritis, arthralgia and muscular pains, albuminuria, purpuric eruptions, and high temperatures are of bad import, as they suggest the onset of a fatal termination. After the acute onset death is not likely to be delayed more than one to four months. The cause of death is streptococcal septicæmia, and tuberculosis has nothing to do with this form of the disease.

REFERENCES.—¹*Med. Jour. and Record*, 1933, May 3, 375; ²*Wien. klin. Woch.* 1933, June, 9, 732; ³*Brit. Jour. Dermatol. and Syph.* 1933, March, 95.

LUPUS VULGARIS. (See SKIN, TUBERCULOSIS OF.)

LYMPHOGRANULOMA INGUINALE. (See also BUBO, CLIMATIC, AND INGUINAL GRANULOMA.) Col. L. W. Harrison, D.S.O.

The condition at present known as lymphogranuloma inguinale (L.I.) is attracting an increasing amount of attention, perhaps because of a strong suspicion that its incidence in Europe is increasing and that in many cases it is going unrecognized, generally being diagnosed as ordinary chancroidal

bubo. Described briefly, the disease commences with a trivial papule on some part of the genital area, e.g., the coronal sulcus in a man, and this is followed by an indolent enlargement of the regional glands (usually the inguinal in the case of men, and in women when the primary lesion is in the vulvar area) which is commonly the cause of the patient's seeking medical advice. The glands suppurate and discharge through fistulous openings, and the condition is usually very intractable. It is important because it is apt to be mistaken at first for the indolent enlargement of glands associated with a primary syphilitic lesion, and later with chancreoid bubo or tuberculous disease, unless the medical attendant is experienced in tropical diseases, when he would recognize it as 'climatic bubo'.

It has now been shown that lymphogranuloma inguinale and climatic bubo are identical. It has also been shown that the elephantiasoid changes of the female genitals with chronic ulceration of the genitals and rectum called by the French 'esthiomène' and by the Germans 'ulcus chronicum elephantasticum vulvæ ani et recti', as also 'syphilome ano-rectal' of Fournier, are due to the same cause, which may also result in anal stricture. The establishment of the identity of all these conditions is largely due to the use of skin tests, a person suffering from L.I. showing a characteristic reaction at the site of an intracutaneous injection of Frei's antigen, which is a sterilized emulsion of pus from buboes of persons suffering from L.I. (see MEDICAL ANNUAL, 1931, p. 92). When the bubo is due to chancreoid infection the reaction is at the site of an intracutaneous injection of dmeclos, a vaccine made from Ducrey's bacillus (see MEDICAL ANNUAL, 1932, p. 92) which may be given at the same time.

The nomenclature is unfortunate because the term 'lymphogranuloma inguinale' is apt to be confused with the nodular and serpiginous ulceration of the genitals known as 'granuloma inguinale' (see MEDICAL ANNUAL, 1933, p. 105). L.I. has hitherto been dealt with only scantily in text-books on venereal disease, and H. Stannus, in a monograph entitled "A Sixth Venereal Disease; Climatic Bubo, Lymphogranuloma Inguinale, Esthiomène, Chronic Ulcer and Elephantiasis of the Genito-ano-rectal Region", has performed a valuable service by collecting the known facts regarding it. The title of his work, "A Sixth Venereal Disease", is justified by the proof that it is contracted by venereal contact, and by the existence of five other diseases due to the same mode of infection—namely, syphilis, gonorrhœa, chancreoid, the genital infection by Vincent's organism sometimes called 'the fourth venereal disease' and granuloma venereum or ulcerating granuloma of the pudenda. The thoroughness with which the author has treated the subject is testified by the fact that in 270 pages he has condensed the information contained in over 900 articles on the various conditions mentioned in the title of the book. The practitioner who has to deal with a condition at all resembling any of those mentioned above cannot do better than refer to this book.

An excellent account of the disease has been published by H. F. De Wolf and J. V. Van Cleve.¹ After shortly reviewing the literature and describing the disease, they report having applied the Frei skin test to 1010 subjects, with positive results in 58 and equivocal ones in 11. Of the 58 positive cases, 31 were actually suffering from L.I., 4 had been treated for it prior to 1930, 20 had a history of it, and 3 had ano-rectal disease. Of 75 clear cases of chancreoid, 2 gave positive Frei reactions; one of these was considered to have a mixed chancreoid and L.I. infection, and the other, who had no bubo at the time, gave a history of a chronic inguinal adenopathy eighteen years previously. The converse test for chancreoid infection (Ito-Reenstierna reaction) was applied with dmeclos in a few cases, and gave positive reactions in

chancroid but not in L.I. In 84 cases of early syphilis the Frei test was negative, and in 58 cases of gonorrhoea it was positive 4 times; all of these 4 had a history of chronic inguinal adenitis. All the 3 cases of ano-rectal disease had stricture of the rectum which had hitherto been attributed to other causes than L.I.; they illustrate the importance of investigating anal and rectal stricture with L.I. in view.

In an article on the relation of L.I. to 'syphilome ano-rectal' of Fournier E. de Gregorio² refers first to the view held by Fournier that a condition characterized by thickening of the lower portion of the rectum reaching generally to the anal orifice, with nodules of various sizes, like hæmorrhoids, in the perineal region, was due to syphilis, and then reviews the evidence identifying the condition with L.I. The condition is often characterized by fistula around the anus and communicating with the bladder, the vagina, or the rectum, while stenosis of the anal opening and lower part of the rectum is a common result. Fournier's view as to the etiology was first supported and then began to be contested, some opponents at first favouring a chancreoid origin and others a gonorrhoeal, until the application of Frei's skin test disclosed the true etiology. The author reports on 19 cases (6 previously published) in which skin tests with Frei's antigen and with dmelcos were performed. With Frei's antigen 17 were positive, 1 doubtful, and 1 negative; with dmelcos 15 were positive, 2 doubtful, and 2 negative. [With regard to the close similarity of these results with the two antigens, other evidence indicates that a patient who reacts with Frei's antigen is suffering or has suffered, from L.I., and one who reacts with dmelcos similarly from chancroid. It can easily be understood that the subjects of these tests belong usually to a class that contracts a variety of venereal diseases. As between chancroid and L.I. in the etiology of 'syphilome ano-rectal' or 'esthiomène' nobody would now have any hesitation in fixing on L.I.—L. W. H.]

It is generally agreed that the elephantiasoid condition is produced by lymphatic obstruction. It is commonly thought that L.I. is more frequent in men than in women, but this is probably because in men it is the inguinal glands which are most frequently affected, while in women, unless the primary focus is at the vulvar or the anal entrance, it is either the meso-rectal or the iliac glands that swell. This suggests that much L.I. in women goes undetected, a supposition which is supported by Gregorio's tests of 53 prostitutes, of whom 29 were positive with Frei's antigen (39 with dmelcos). With regard to the relation of syphilis to ano-rectal stricture, the question is complicated by the natural frequency of syphilis in these women. The author would not rule out syphilis entirely, but relates a case in which the ano-rectal condition appeared before the syphilitic infection. [Syphilis could conceivably add to an obstruction of lymphatics that was primarily due to L.I.—L. W. H.]

M. B. Sulzberger and F. Wise³ have recently suggested that the term 'lymphopathica venereum' would be better than 'lymphogranuloma inguinale'. Their article presents a sketch of the salient features of a disease which they think is fairly widely disseminated in U.S.A., but is not being recognized as frequently as it should be. A considerable amount of work on transmission of L.I. to lower animals has been carried out, notably by Hellerström and Wassen and by Levaditi and colleagues, and recently C. Jonesco-Mihaiesi, A. Tupa, B. Wisner, I. Mesrobeano, and G. Badenski⁴ have presented evidence that a certain proportion of monkeys inoculated intraperitoneally with L.I. virus (the virus appears to be a filter-passer) develop nerve symptoms somewhat resembling those of tabes, with, histologically, degeneration of sensory nerves, posterior nerve-roots, and columns of Goll and Burdach. [So far no such effect of L.I. appears to have been noted in man.—L. W. H.]

F. Koch⁵ reports on experiments which indicate that guinea-pigs are more resistant to L.I. than are monkeys and mice. In the latter the infection is symptomless, and the author suggests that the mouse is likely to prove a useful animal for chemotherapeutic investigations. He was unable to repeat the positive results obtained by Hellerström and by Levaditi with L.I. material that had been passed through a Chamberland filter candle.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1932, Sept. 24, 1065; ²*Presse méd.* 1932, Sept. 17, 1416; ³*Jour. Amer. Med. Assoc.* 1932, Oct. 22, 1407; ⁴*Bull. de l'Acad. de Méd.* 1933, cix, 652; cx, 88; *Comptes rend. Acad. de Méd.* 1933, cxvii, 1551; ⁵*Arb. a. d. Reichsgesundheitsamte*, 1933, lxxv, 581.

MALARIA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY AND PROPHYLAXIS.—Much detailed work on the epidemiology of malaria in relation to mosquito carriers and its bearing on prophylaxis in different malarious countries continues to be reported, of which the following is the most important. In India G. C. Ramsay and J. de la M. Savage¹ report further work in Assam, and they emphasize once more the great importance of *A. minimus* as almost the sole carrier in Assam, and the harm that may be done by encouraging its breeding by clearing jungle that is shading clear and slowly running water in which it breeds in the absence of shade. C. C. Harrison and G. C. Ramsay² deal on very similar lines with the neighbouring area of the Duars in North Bengal, and advocate planting dense shade-producing vegetation along narrow streams and drains and in exposed swamps, etc., and suggest abandoning the irrigation of rice fields around coolie lines, as the malaria here is mainly man-made through erroneous clearing of jungle along streams. In the Mingaladon cantonment near Rangoon in humid South Burma, M. Jafar³ found *A. maculipalpis* to be the main carrier. Near Calcutta M. O. T. Iyengar⁴ has worked out experimentally the malaria-carrying anopheles for the three varieties of the disease, and he found the effective infectivity rates among gametocyte carriers to be 67.6 per cent for *P. falciparum*, 40 per cent for *P. vivax*, and only 21.2 per cent for the rarer *P. malariae*.

In the New Ireland island of New Guinea E. A. Holland⁵ reports that stocking all known breeding places of anopheles in thirty-two villages in a coastal area seventy-two miles long with the small larva-eating fish, *Gambusia affinis*, was followed by a reduction in the spleen-rate from 24.6 per cent in August to 4.2 per cent in the following July, while in untreated areas the rate fell in the same months only from 47.1 to 28.8 per cent. The season was an unusually dry one, so unfavourable to malaria.

In Africa E. G. Gibbins⁶ reports on anopheles carriers in Kampala, Uganda, where he has carried out very extensive feeding experiments. He confirms the great importance of *A. costalis* and *A. funestus* as by far the most prominent carriers, as four others incriminated were not encountered in more than one region each. He thinks that *A. funestus* may play the more important part at certain seasons owing to acceleration in the development of sporozoites then as compared with that in *A. costalis*. In Freetown R. M. Gordon and others⁷ also found *A. costalis* and *A. funestus* the only important carriers, but they rarely remain in the same house for more than twenty-four hours. They report that a great reduction in their prevalence has taken place in the last thirty years, mainly owing to drainage and other antilarval measures.

A. W. Iredell⁸ reports a reduction in malarial incidence due to mosquito-proofing barracks of Royal Air Force men in India.

CLINICAL.—Further studies by cultural and enumerative methods are reported by R. Knowles and B. M. Das Gupta⁹ in Calcutta, who found that quartan malaria does not show the tendency of the other two forms to spontaneous cure, but it has very prolonged afebrile periods with a low grade of blood

infection persisting and relatively large numbers of gametocytes. In cases of malaria with blackwater-fever complication **Quinidine** and **Atebrin** should be given instead of quinine. In all cases of malignant tertian malaria 0.01 gm. of **Plasmochin** twice daily for two days should be given to clear the blood of crescents. Atebrin in 0.1-grm. doses thrice daily for four days is efficient in benign tertian and quartan malaria and also against the asexual stages of malignant tertian parasites.

The diagnosis of malaria by thick blood-films is dealt with by R. Green.¹⁰ A thick drop of blood is spread over a half-inch circle and dried for some hours, but should be stained within twenty-four hours with Giemsa stain in buffered distilled or tap water, using 1 gm. of potassium dihydrogen phosphate and 2 gm. of di-sodium monohydrogen phosphate in a litre of water to have a pH value of about 7.0.

H. C. Brown¹¹ reports on electric charge of the erythrocytes in bird malaria, which he finds bears an inverse ratio to the parasite rate; he also finds that reduction in the charge in an infected bird influences the phagocytosis rate.

Immunity in malaria is discussed at length by J. G. Thomson¹² in the light of studies of bird and monkey malaria, and he concludes that there is some evidence to support the view that protective antibodies do exist and that phagocytosis plays an important part in controlling infections in man.

J. A. Sinton and H. W. Mulligan¹³ record a note on intradermal reaction to malaria in monkeys, using an antigen made by digesting with papain a suspension of malarial parasites washed free from hæmoglobin and injecting 0.05 to 0.10 c.c. "either of the filtered digest or the redissolved deposit, which was obtained after this digest was added to a large excess of alcohol". In infected as compared with healthy monkeys the immediate reaction up to three and fifteen minutes was less, but the delayed reaction was more marked in three to four hours and reached its maximum in twenty-four hours, when absent or nearly so in normal animals.

S. P. James, W. D. Nicol, and P. G. Shute¹⁴ record the successful passage of *Plasmodium ovale*, Stephens, through *A. maculipennis* and transmission of the infection to man by their bites. K. P. A. Taylor¹⁵ describes the presence of occult blood in vomit and the absence of abdominal rigidity as important clinical points in favour of a diagnosis of malaria as against acute abdomen. D. Anderson¹⁶ in S. Nigeria found that the seasonal variation of the spleen-rate only gives a rough indication of the prevalence of malaria. N. H. Fairley¹⁷ reports a case of *Plasmodium ovale* infection contracted in West Africa.

TREATMENT.—**Plasmochin** is being increasingly used in small doses for its prophylactic effects in destroying the sexual stages of the parasites in the blood and so preventing their development in and transmission by mosquitoes. Thus W. W. Chemesha¹⁸ reports trials of the drug for this purpose in Ceylon labour forces by two methods. In the first all the community are dosed two or three times weekly with quino-plasmochin for eight to twelve weeks during the period of the active spread of malaria, and in the second plan for very malarious areas where anti-larval methods are impossible, two doses a week are given all the year round. It is important to include infants, as in one instance the escape of some of them from treatment partially vitiated the results, but malaria was much reduced at a lower cost than the loss a severe outbreak of malaria would have caused. The doses used do not appear to be stated, although 0.01 gm. of plasmochin is mentioned as sufficing.

N. G. Banerjee and P. Brahmachari¹⁹ report a case in which hæmoglobinuria occurred during the treatment of malaria by atebrin and plasmochin. S. N. Sur, H. P. Sarkar, and K. M. Banerji²⁰ advocate the administration of plasmochin, 0.02 gm. in adults and 0.01 gm. in children under 12, given daily

for three days, followed by **Quinine**, and they found the combination both effective in treatment and in preventing the blood of the patient being infective to mosquitoes. J. B. Rice²¹ has tested the prophylactic value of plasmochin in Liberia by first treating the negro patients with 1 grm. of quinine and 0.02 grm. of plasmochin for two weeks to eliminate old infections, and in a portion of them plasmochin was continued daily while they were subjected to the bites of *A. costalis* infected with subtertian malaria, and others were kept as controls. It was found that a daily dose of 0.03 grm. of plasmochin for several months did not produce any untoward symptoms, and that a daily dose of 0.34 mgrm. per kilo or more protected the persons taking it from infection, or 0.023 grm. (2.3 cgrm.) for a man of 150 lb. weight, but smaller doses failed.

J. C. Paterson²² reports on the value of plasmochin in cases of blackwater fever and quinine hæmoglobinuria. He found malarial parasites in the blood of 6 out of 16 cases of blackwater fever (5 subtertian and 1 benign tertian), the parasites being abundant in three, in which he found plasmochin sufficed to control the infection until it was safe to give quinine. The drug was injected intramuscularly twice daily in 0.03-grm. doses for two days and then given in tabloid form.

P. F. Russell and R. L. Holt²³ report a field experiment in malarial prophylaxis with tablets of **Chinoplasm** (quinine 0.3 grm. and plasmochin 0.01 grm.) in the Philippines on a plantation, and it was found that although two tablets a day failed to stop all infections it did prevent all clinical signs of malaria. K. Lindberg²⁴ in the Deccan, India, found that 0.02 grm. plasmochin twice daily for three days did not prevent malarial relapses, but it materially reduced new infections.

Atebrin has also been further favourably reported on as shown by the following records. A. L. Hoops²⁵ in the Straits Settlements found it to be simple, rapid, and more effective in preventing relapses than quinine. He gave 0.3 grm. ($4\frac{1}{2}$ gr.) divided into three doses daily for five days, the 15 tablets costing 2s., against 2s. 4d. for 1 oz. of quinine. In subtertian cases in addition 0.03 grm. ($\frac{1}{2}$ gr.) of plasmochin was given daily divided into three doses of 0.01 grm. for five days, at a cost of 1s., which was worth while to prevent relapses. R. Row and others²⁶ have tested atebrin in monkey malaria and found that it rapidly caused the disappearance of parasites from the blood, but failed to prevent their reappearance in a virulent form. A. J. Orenstein²⁷ in S. Africa treated eight malarial cases, selected as especially severe ones, with 0.1 grm. of atebrin and 0.01 grm. of plasmochin three times a day for four days with repetition of the course after a few days, with very satisfactory results, including one case in a pre-hæmoglobinuria state. O. D. Jarvis²⁸ reports on trials of both the new drugs in the British Army malarial convalescents at Kasauli, India, and he records that of 106 benign tertian cases treated with 0.03 grm. plasmochin and 20 gr. of quinine daily for twenty-one days only 5.7 per cent relapsed. Of 5 cases of benign tertian and 3 of malignant tertian treated with 0.3 grm. atebrin daily for seven days none relapsed, so it should be tested further.

Careful trials of plasmochin and atebrin in numerous cases of malaria in South Africa, with a view to finding a reliable method of sterilizing the blood as regards malarial parasites, is reported by P. N. H. Labuschagne,²⁹ who found quinine and plasmochin failed in attaining this object, and atebrin in the quantities recommended by the makers was not fully reliable. Better results, with about 60 per cent of cures over a period of three months, were obtained by giving two tablets containing 0.1 grm. each twice a day for five days, making a total of 2 grm., followed by four tablets once a week in a single dose to keep the blood free of both the asexual and sexual stages of the

parasites. No toxic symptoms were noted and the yellow discoloration of skin is of no consequence. He advocates mass treatment during the malarial season with such doses. P. J. Hanafin³⁰ tested the value of plasmochin as a prophylactic during service conditions in a very malarious area of Burma, and he concluded that a daily dose of 0.02 gm. was too low, but 0.03 or 0.04 gm. will probably be found to be efficient, and that 0.03 gm. would appear to be harmless when continued over long periods. The treatment of 30 Ceylon malarial cases with plasmochin and quinine for seven to ten days is reported on by E. C. Spaar³¹ with a relapse rate of 16 per cent; he advises $\frac{1}{2}$ gr. of the former and 15 of the latter daily as safe and effective.

Yet another new synthetic drug, **Tebetren**, combining quinine with acridine, is reported on by D. G. Soute.³² It can be given as two 3-gr. tablets four-hourly or in cerebral cases in 2.1-c.c. ampoules four-hourly intramuscularly without much pain, and is stated to be more rapid in its action than quinine, and that it may inhibit the formation of gametes. Further trials appear to be indicated.

Among the older malarial remedies, **Hydroquinine Sulphate** is reported on by J. P. Sanders and W. T. Dawson³³ as given in doses daily for four days before the chill, and he states that it is to be equal to quinine. A. M. Robers and C. W. Leach³⁴ report the successful treatment of a patient hypersensitive to quinine by **Quinidine Sulphate** to a total of 1.6 gm. in four days after smaller trial doses. J. P. Sanders and W. T. Dawson³⁵ record the use of the same drug in similar doses in 40 malarial cases with rapid cessation of fever, and in those followed up for one hundred days 57 per cent of benign tertians and 47 per cent of malignant tertians remained well. J. C. Paterson³⁶ reports on **Alkaline Therapy** in blackwater fever, with a mortality of less than 17 per cent in cases showing an alkaline reaction of the urine at the onset or after alkalization of the urine by treatment. As **Sodium Bicarbonate** orally proved insufficient to produce this effect in 75 per cent of the cases, the drug was injected intravenously with better results, but is probably of little value once uræmia has set in.

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MALTA FEVER. (See UNDULANT FEVER.)

MATERNAL MORTALITY AND MORBIDITY.

Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.

The issue of the final Report of the Ministry of Health Committee¹ appointed to investigate the causes of maternal mortality has not unnaturally been followed by the publication of various views, both in support and criticism of the conclusions and recommendations contained in the Report.

In introducing a discussion at the Royal Society of Medicine upon the work of the Departmental Committee, W. H. F. Oxley² stressed the point that in 6000 maternal deaths which had been analysed by G. F. Gibberd and Arnold Walker,¹ one or more of four 'avoidable' factors were disclosed in 48·8 per cent of the cases. These 'primary avoidable factors', which in Oxley's opinion would probably have shown a still higher proportion had the information available to the Committee been more complete, are as follows: (1) An error of judgement in the management of the case; (2) Omission or inadequacy of antenatal treatment; (3) Lack of reasonable facilities for treatment; (4) Negligence of the patient or her friends. The cases in which no departure from established practice could be recognized amounted to just over half of the total, and it is interesting to note that in this large category are included most of the cases of sepsis, some cases of eclampsia, and the majority of 'shock', ante-partum hæmorrhage, and pulmonary embolism. Oxley is of opinion that the routine midwifery service in Holland and Scandinavia is superior at present to that which obtains in Great Britain—a view based upon comparative studies of the maternity work in the Netherlands, Denmark, and Sweden made upon the spot in conjunction with Miles Phillips and James Young.¹ For the five years 1925–9 the average maternal death-rate in Holland has been 2·98 per thousand, against 4·2 in England and Wales.

In an impartial review upon the Commission's report, Sir Walter Fletcher³ raises the important point that the favourable figures in these countries may not be unconnected with the fact that in these particular areas rickets is rare and pelvic contraction correspondingly uncommon. With the gradual elimination of this disease that is now proceeding in Great Britain as a result of improved standards of diet and living, Fletcher anticipates a gradual shift towards normality of the pelvic measurements of British women, with a correspondingly lowered maternal mortality. The author also calls attention to the fact that 87 per cent of all the deaths are accounted for by sepsis, and observes that "it is hard to believe that any who read the evidence provided in the Report will take the responsibility of ignoring the strong recommendation of the Committee that the same precautions of using gloves and face-masks should be adopted during every labour as are thought indispensable now at every surgical operation. In the absence of face-masks, other precautions such as securing the absence of infected 'carriers', the avoidance of talk in the labour wards, and of bending unnecessarily over the patient become more imperative." The fact cannot be overlooked that 18 per cent of all the deaths are due to sepsis after quite normal labour. The research work in progress or contemplated which is noted in the Report may be expected to provide valuable information upon this special group of cases. L. Colebrook⁴ has recently published important results from the research unit at Queen Charlotte's Hospital dealing with the *anaerobic forms of streptococci* definitely associated in many cases with puerperal infection. These anaerobes appear to be chiefly endogenous in origin, and have escaped notice hitherto because they are missed in routine bacteriological examination unless anaerobic methods are used.

A less optimistic view as to the future has recently been expressed by F. J. Browne,⁵ who points out that although the number of antenatal clinics in England and Wales is now 1262 and antenatal care has been a routine part of obstetric practice for over a quarter of a century, the high hopes with which it was introduced have not been realized. The maternal mortality from all causes has not diminished within recent years. In 1911 the total puerperal mortality was 3·87 per 1000 live births, and in 1930 it was 4·40! Both as regards puerperal sepsis and eclampsia the mortality-rate has if anything increased. In order to obtain information on the causes of this persistent

high mortality Browne examined 33 recent annual reports of nine maternity hospitals of the highest standing, investigating the death-rate and causes of death amongst the 'booked' cases only—i.e., amongst patients who presumably had received the best antenatal care in the country. The results are interesting in that the death-rate per 1000 varied between 0.66 and 14.4, the average being in the neighbourhood of 2.3 to 3.7. In an analysis of the causes of death amongst 173 patients, Browne notes 35 cases of easy uncomplicated labour or low forceps, made up as follows: sepsis 22, shock 5, post-partum hæmorrhage 4, embolism 1, various 3. This group the author regards as 'unavoidable'. In 25 cases of 'complicated labour' he considers that 21 of the deaths might have been avoided, and criticises the antenatal care. In 14 deaths from toxæmia of late pregnancy he is also of opinion that 9 might have been prevented. Clean uncomplicated Cæsarean section accounted for 18 fatalities, 15 of which are classified as 'avoidable'. Induction of premature labour was followed by death on 8 occasions, all of which the author considers were preventable. *Induction of labour* is usually regarded, as the author says, as a very safe operation, and to-day is often somewhat lightly undertaken; but these records show that it is not always so safe.

The failure of antenatal care to prevent mortality is explained by Browne on the basis: (1) That it cannot yet prevent such causes of death as sepsis and post-partum hæmorrhage after normal easy labour; (2) That, whilst it has diminished the incidence of complicated labour, it has led to an increase of unnecessary interference by the induction of premature labour and Cæsarean section; (3) That very little is being done in the average antenatal clinic to prevent eclampsia; (4) The high mortality in maternity hospitals from the minor complications of labour appears to indicate the importance of adopting the principle of a resident whole-time obstetrician of senior standing—too much responsible work is at present being allocated to house officers without senior supervision; (5) Much of what passes under the guise of antenatal care both in and out of hospital is too irregular, too infrequent, too ill-organized and perfunctory to deserve the name, and as at present conducted can never accomplish anything except to bring preventive midwifery into ill-deserved disrepute.

The public antenatal clinic has also recently been criticized by J. S. Fairbairn⁶ on the basis that, as now constituted, it is so frequently placed under the charge of a practitioner who has no responsibility for the patients during the natal and postnatal periods. Fairbairn observes, and very rightly, that those in charge under such conditions suffer from the grave disability of being unable to learn from the most compelling of instructors, their own failures. The justification usually given for the breaking of this universally accepted principle is that the establishment of such clinics was forced on the public health authorities by the failure of general practitioners and midwives to do the work adequately. This argument is no longer tenable—a fact which is further emphasized by the failure of over 1200 existing antenatal clinics to lessen the annual toll of maternal deaths!

One of the main recommendations of the Report of the Ministry of Health Commission is that a *national maternity service* shall be established. The carrying into effect of this sweeping change has been temporarily rendered impracticable as the result of financial stringency, but there can be little doubt that, unless a material change for the better takes place in the very near future, the question will again be brought forward and the necessary legislation introduced. Whilst a closer linking-up and co-ordination between all the services available is no doubt desirable, the question is asked by G. I. Strachan,⁷ 'What will be the nature of the 'supervising authority' which such a service would entail? Should it be of a bureaucratic nature with an insatiable desire for

form-filling and inspections, the result on obstetrical practice is, in the opinion of Strachan, likely to be disastrous!

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MEASLES.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—P. Stocks¹ brings forward additional evidence from his investigations in certain London boroughs (St. Pancras, Battersea, and Paddington) in support of his hypothesis (*see* MEDICAL ANNUAL, 1930, p. 335) that in measles a temporary latent immunization occurs among the child population of densely populated areas, and that this may be the main factor responsible for bringing epidemics to an end and determining their periodicity.

SYMPTOMS AND COMPLICATIONS.—M. Tapia, J. Orensanz, and C. Diez² made a radiological study of the *pulmonary lesions* in 57 cases of measles, and found abnormal shadows in 31. The frequency of these changes appeared to be in inverse relation to the age and in direct relation to the gravity of the disease. The radiological changes were grouped in the following four classes: (1) Increase of the hilar shadow; (2) Nodular shadows; (3) Parenchymatous infiltrations; (4) Cavities. The lesions represented by these radiological appearances sometimes occurred without giving rise to any clinical symptoms, and when symptoms were present there was no relation between their intensity and the extent of the pulmonary lesion. The lesions described always appeared very early and almost always during the acute stage of the disease, and in convalescence disappeared in the course of three to four weeks. The evolution of the lesions, the negative result of the tuberculin reaction, and bacteriological and pathological examinations excluded the possibility of tuberculosis. In the present state of our knowledge it is impossible to decide whether the lesions are due to the virus of measles alone or to associated organisms. The clinical interest of these investigations consists in the necessity of not mistaking an acute inflammatory process for active tuberculosis.

The *relation of measles to tuberculosis* is discussed from various points of view by H. Koch,³ A. Magrin,⁴ and J. L. Kohn and H. Koiransky.⁵ Koch³ maintains that in a considerable number of cases measles tends to activate tuberculosis, although this is not an invariable rule. Young children and those who have recently become infected with tuberculosis run most risk from measles. Such cases should be inoculated with convalescent serum, as there is little likelihood of activation of the tuberculous process when the attack of measles has been attenuated. Magrin⁴ made a study of 42 children who had contracted measles while under treatment for pulmonary tuberculosis, with the following results. In 23 no clinical or radiological evidence of aggravation of the lung disease could be found; in 5 there was a temporary loss of weight and change in the general condition, without any local aggravation; and in 14 there was a definite deterioration both of the general condition and of the pulmonary disease as shown by radiological examination. Magrin also collected records of 13 other children in whom measles roused a dormant infection into activity, causing a local diffusion of the disease with caseation, or generalization of tuberculosis by the blood-stream. Kohn and Koiransky⁵ made a clinical and roentgenographical examination of 20 children, aged from 10 months to 7 years, infected with tuberculosis who contracted measles. The cases were followed up for a period ranging from two weeks to twenty-two months. The clinical course and the roentgenographic changes in the lungs during and after measles varied. Six patients, of whom five were negroes, died. While maintaining

that too rigid conclusions should not be drawn from the roentgenographic evidence alone the writers hold that in young children measles in many cases contributes to the spread of the tuberculous process.

B. Benjamin and S. M. Ward⁶ examined the *leucocytic reactions* in 46 cases of measles, including 20 cases in the incubation stage: 45 were children aged from 9 months to 12 years, and 1 was an adult. During the incubation period the variations in the number of leucocytes are relatively slight. On the first day of the prodromal stage there is a sharp decrease in the number of lymphocytes and eosinophils, and an increase in the number of monocytes and polymorphonuclear neutrophils. At the height of the disease there is a diminution of all the white cell elements. Histological examination of a lymph gland from one patient showed that the development of the lymphopenia in measles was coincident with marked hyperplasia of the lymphoid tissues.

L. J. M. Laurent⁷ reports the case of a male infant, aged 8 months, who on the twentieth day of a mild attack of measles developed extensive *purpura* of the face, arms, and thighs without any hæmorrhages from the mucous membranes. Examination of the blood showed: red cells 4,200,000 per cmm., hæmoglobin 45 per cent, white cells 12,400 per cmm., polymorphonuclears 22 per cent, large mononuclears 10 per cent, lymphocytes 68 per cent, and thrombocytes 220,000 per cmm. No improvement followed intramuscular injection of 40 c.c. of antistreptococcal (scarlatinal) serum, but twenty-four hours after intramuscular injection of 50 c.c. of fresh citrated blood from the mother the lesions ceased to extend, and in six days had completely disappeared. The case was remarkable for the comparative rarity of *purpura* as a sequel of measles, the absence of thrombocytopenia, and the rapid disappearance of the lesions after injection of the mother's whole blood.

A case of *hemiplegia* following measles is reported by L. Babonneix, Riom, and Wilm.⁸ The patient was a girl, aged 3 years, who on the eighth day of a severe attack of measles became cyanosed, had twitchings in the right arm, and fell into a deep sleep during which the right arm frequently twitched. The following day she was found to have right hemiplegia and aphasia. Contracture subsequently developed in the right arm, but the issue of the case is not recorded. There was no evidence of inherited syphilis. The hemiplegia was probably due to encephalitis, as in most of the cases recently recorded.

C. L. Thenebe, M. Hirshberg, and V. Cenci⁹ record 6 cases of *appendicitis* which occurred among 371 cases of measles admitted to hospital in the course of ten years. The ages of the patients ranged from 5 to 6 years. Three were boys and three girls. One was in the prodromal and five in the eruptive stage. Operation was performed in each case and all recovered. The complication may be a mere coincidence, or be due either to mechanical pressure upon the blood-vessels by the hyperplastic lymphoid tissue in the appendix or to a possible relationship between streptococcus pharyngitis and appendicitis. (See also MEDICAL ANNUAL, 1933, p. 290.)

TREATMENT.—J. B. Ellison¹⁰ treated 300 cases of measles with a cod-liver oil concentrate of vitamins A and D in the form of *Adexolin*, 20 min. daily during the acute stage of the disease: 11 deaths occurred in this series as compared with 26 deaths in a control series of 300 cases with a similar age distribution. Pulmonary complications appeared to be less severe in the treated cases than in the controls, but no difference was detected between the two groups as regards the incidence of otitis media and skin lesions.

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MECKEL'S DIVERTICULUM.*John Fraser, Ch.M., F.R.C.S.Ed.*

The clinical aspects and the pathology of Meckel's diverticulum are the subject of an interesting paper by H. W. Hudson.¹ Last year a series of 32 cases was reported; the present contribution concerns 13 cases. It is recognized that a certain proportion of Meckel's diverticula contain areas of mucous membrane similar to that found in the stomach, that they produce an acid secretion comparable to gastric juice, and that they are liable to ulcerative changes on a parallel to those encountered in the stomach. Hudson recounts his investigation of a boy aged 11 years in whom the diverticulum discharged as an umbilical fistula, and from examination of the fluid he was satisfied of the similarity of the discharge to gastric juice. He notes that when ulceration occurs it affects not the lining of the diverticulum but the mucous membrane at the neck of the diverticulum or the mucosa of the adjacent ileum.

The paper includes a series of case histories typical of the clinical features to be anticipated in a Meckel's diverticulum, and in discussing the operative treatment he recommends excision of the process, and condemns the procedure sometimes followed of inversion overstitched by a purse-string suture.

REFERENCE.—¹*New Eng. Jour. Med.* 1933, March 9, 525.

MEDITERRANEAN FEVER. *(See UNDULANT FEVER.)***MEGALERYTHEMA EPIDEMICUM.** *(See ERYTHEMA INFECTIOSUM.)***MELANOSIS OF COLON.** *(See COLON, MELANOSIS OF.)***MÉNIÈRE'S DISEASE.** *(See VERTIGO.)***MENINGITIS, DIFFUSE SUPPURATIVE, OF NASAL OR AURAL ORIGIN.** *(See also CENTRAL NERVOUS SYSTEM—TREATMENT OF INFECTIONS OF.)**F. W. Watkyn-Thomas, F.R.C.S.*

TREATMENT.—At present our treatment of cases of suppurative meningitis is carried out by various combinations of the following procedures:—

1. Radical removal of the primary focus of infection.
2. Drainage of cerebrospinal fluid, either (a) *periodically* by lumbar, occipital, or ventricular puncture, or (b) *continuously* by drainage of a cistern such as the cisterna pontis by the translabyrinthine route, or of the cisterna magna. This may be combined with lavage from a lumbar puncture to the upper orifice.
3. Immunization by (a) intrathecal injection of sera or chemical disinfectants, or (b) massive removal of cerebrospinal fluid and blood transfusion from an immunized donor, in the hope that the drainage of fluid may overcome the resistance of the choroid plexus, already made more permeable by inflammation, and so allow the antibodies to reach the subarachnoid spaces, or (c) intracarotid injection.

All these methods have occasionally been successful, and all usually fail. Probably, on the whole, the best results have been obtained in meningitis of labyrinthine origin treated by **Labyrinthotomy and Translabyrinthine Drainage**; but even in these cases, where a radical excision of the focus is surgically easy and drainage can be maintained along the actual track of the infection, failures far outnumber successes.

In a recent communication Otto Mayer¹ records observations which may be of the utmost importance in the treatment of these cases. A girl had a cerebral abscess which burst into the lateral ventricle and caused meningitis. The abscess cavity was filled with a radio-opaque substance, abrodil, in order to find the site of rupture. The first skiagram was taken with the patient

lying down, and showed abscess cavity, ventricle, and fistula all full of the fluid. The recumbent position caused such pain that she was allowed to sit up for the next skiagram, and, as she sat up, air entered the cavity and the ventricle; this was followed by a free flow of cerebrospinal fluid, and the patient recovered. Encouraged by this, Mayer tried deliberate **Intrathecal Injection of Air** in two other cases. In one of these (a child of 4) meningitis followed four days after an operation for acute mastoiditis; in the other meningitis was caused by a slate pencil driven up the nose, through the cribriform plate, and into the brain, where it was lodged. It is hard to think of more hopeless conditions, but both patients recovered.

Mayer's explanation is that the cerebrospinal fluid, altered by fibrinous exudate, tends to block up the drainage of the cisterns and ventricles and to form pockets of pus. It is a common observation that those of our patients who do recover always have a free and continuous flow of fluid. [This is well shown in successful cases of translabyrinthine drainage.—F. W. W.-T.] For this reason alone lumbar puncture may be dangerous unless there is an adequate secretion of fluid to dilute the exudate. If there is no such secretion, the fluid no longer circulates, absorption by the Pacchionian bodies and the perineural sheaths cannot take place, and the 'water cushion' on which the brain rests is abolished.

Mayer's method is very simple. **Lumbar Puncture** is done and the fluid is allowed to escape until it comes out in drops. Then 10 c.c. of 10 per cent **Urotropine** with 20 c.c. of **Air** is injected through the lumbar puncture needle. This must be done at least daily. Urotropine is used, not because of any supposed 'disinfectant' action but for its hypertonic effect. **Hypertonic Saline** may be used instead, but whatever hypertonic solution is used, the concentration must not be too high, or it may cause myelitis. [Only these three cases are reported by Mayer, but if on further trial similar results are obtained, this must be regarded as an advance in our method of treatment as important as West and Scott's invention of translabyrinthine drainage in 1908, or Jenkins's first work on intrathecal lavage ten years ago. A similar case is reported below.—F. W. W.-T.]

P. D. Kerrison,² in a discussion at the American Otological Society, pointed out that attempts to drain the meninges surgically failed because of the rapid closure of the incisions and the formation of adhesions. To avoid this he advised Kubie's method of 'forced drainage'. Dilution of the blood by intravenous injection of hypertonic saline caused an immediate increase of cerebrospinal fluid, and this increase could be accentuated by injection of posterior **Pituitary Lobe Extract**. Such an increase should wash out the exudate which blocks the perineural lymphatics and the perivascular spaces. He regards the cisterns above and below the tentorium and the region of the Sylvian fissure as the most important. For the tentorial cisterns he recommended obliteration and opening of the lateral sinus, and multiple incisions through the inner wall in order to drain the subarachnoid spaces. The fissure of Sylvius can only be drained after wide temporal exposure.

Kubie, in replying, agreed with the theoretical conclusions, but pointed out that any large bony opening would allow a mass movement of the brain, which would quickly block the opening and obstruct drainage. He quoted a case (not one of Mayer's previously described) in which an injection of a small quantity of air into the meninges had been followed by a free discharge of pus and recovery.

W. P. Eagleton³ studied 367 cases of suppurative meningitis, of which 212 were operated on and 68 recovered (18.5 per cent of all cases). According to Eagleton localized meningitis is surgically operable: (1) In the region

of the sacculus endolymphaticus; (2) In the arachnoid extension into the internal auditory meatus and the cisterna pontis; (3) In the subdural spaces of the anterior and middle fossæ; (4) In the cisterna basalis. An important section of the paper is a description of *meningitis arising from the sphenoidal sinus*. Some cases of pneumococcal infection cause septic infarction of the temporal bone. This travels by the petrosquamous suture and causes thrombosis of the tympanic vessels with perforation of the membrane and discharge. Such cases are sometimes diagnosed as mastoiditis.

The chemotherapy of meningitis has been studied by K. Beck, M. K. Beringer, and M. Gundel¹ with **Urotropine**, **Septojod**, **Solganal**, and **Trypflavine**. It was found that trypflavine injected into the lumbar theca bestowed definite bactericidal qualities on the cerebrospinal fluid. The writers suggest that early injection in the non-purulent stage of meningitis might be of therapeutic value. Unfortunately, G. Eigler and W. Geisler² attempted trypflavine injections in five cases of meningitis and on two monkey controls, and unhesitatingly condemn the method. All the subjects died, and, post mortem, lesions of the transverse myelitic type were found in the neighbourhood of the injections, which could not have been caused by the meningitis alone. F. Gebenegger,³ on the other hand, reports some success with **Solganal**. It was tried on a 'mixed' group of 14 cases. Two cases of lymphocytic meningitis and two of suppurative meningitis recovered. One of the 'lymphocytic' cases was probably tuberculous. Gebenegger thinks a further trial is justified, but remarks that pyrexial reactions, hematuria, and suppression of urine have occurred after injection.

Oral immunization against pneumococcal meningitis is discussed by J. A. Kolmer and K. W. Amano.⁷ Rabbits were fed by a stomach tube with **Vaccines** of virulent I, II, and III type pneumococci, prepared in different ways. Doses were given every day for a week, and a week later the animals were inoculated with undiluted cultures of living cocci intra-tympanically or intra-cisternally. A series of unimmunized rabbits were inoculated with the same doses at the same time. It was found that from 25 to 100 per cent of the immunized animals survived (the lowest survival rate was that of animals immunized by heat-killed milk cultures of pneumococcus I). None of the controls survived the pneumococcus I and II infections; 33 per cent of controls recovered from the pneumococcus III. The best immunizing vaccine was obtained from organisms killed with hydrochloric acid and dissolved in sodium taurocholate. It is suggested that, if time permits, patients with pneumococcal paranasal sinusitis and otitis might be prepared with vaccines before operation.

In connection with **Serum Treatment** J. B. Cavenagh⁸ reports a case of *pneumococcal meningitis* cured by serum. An area of inflamed dura was found at the mastoid operation, but no evidence of extradural abscess. Type III pneumococci were found in the cerebrospinal fluid. Intrathecal injections of anti-pneumococcal serum effected a cure.

F. Fuchs⁹ reports a rare case of *post-operative diphtheritic meningitis*. This followed an intranasal operation for antro-ethmoidal sinusitis. Meningitis followed on the fifth day, and Klebs-Loeffler bacilli were found in the cerebrospinal fluid. The patient was cured by **Diphtheria Antitoxin**.

REFERENCES.—¹Wien. klin. Woch. 1933, i, 161; ²Ann. of Otol. Rhinol. and Laryngol. 1932, xli, 651; ³Ann. d'Oto-Laryngol. 1932, Sept., 957; ⁴Munch. med. Woch. 1933, Aug. 12, 1305; ⁵Arch. f. Ohren-, Nasen- u. Kehlkopfch. 1933, cxxxiv, 201; ⁶Wien. klin. Woch. 1933, i, 238; ⁷Laryngoscope, 1932, xlii, 610; ⁸Jour. of Laryngol. 1933, xlviii, 337; ⁹Monats. f. Ohrenheilk. 1933, March, 310.

MENINGITIS, MENINGOCOCCAL. (See CEREBROSPINAL FEVER.)

MENINGITIS, TUBERCULOUS. *Macdonald Critchley, M.D., F.R.C.P.***DIAGNOSIS.—**

The Tryptophan Test.—H. H. Lichtenberg¹ has found the tryptophan test in the cerebrospinal fluid of service in the diagnosis of tuberculous meningitis. Details of the technique are as follows: to 2 or 3 c.c. of spinal fluid, 15 to 18 c.c. of concentrated HCl and 2 or 3 drops of a 2 per cent solution of formaldehyde are added. The mixture is shaken and allowed to stand for four or five minutes. The solution is then layered with about 1 or 2 c.c. of a 0.06 per cent solution of sodium nitrite, and allowed to stand from two to three minutes. At the junction of the two liquids a delicate violet ring is formed if the reaction is positive, and a brown ring or none at all if negative. Readings should be made in the daylight. Doubtful reactions should be considered as negative. The test is roughly quantitative, so that in advanced cases of tuberculous meningitis 1 c.c. or even 0.25 c.c. will give a distinct reaction. In doubtful cases it is advisable to use the full 2 or 3 c.c. of spinal fluid. Out of the author's series of 78 fluids, a positive result appeared only in those cases where the diagnosis was confirmed at autopsy, or by inoculation of guinea-pigs, or by the demonstration of tubercle bacilli in the fluid. The test proved of value even in early cases, before characteristic clinical signs were demonstrable. None of those cases in which the test was negative subsequently developed further signs of tuberculous meningitis.

TREATMENT.—No malady is associated with graver prognostic significance than tuberculous meningitis, and therapeutic endeavours are ordinarily entirely futile. The very occasional instance of recovery, indeed, merely seems to place under suspicion the original diagnosis. For these reasons, the recent publication of T. A. Jousset² arouses great interest, for the author has had the most unusual experience of having treated successfully no fewer than 15 cases in which the diagnosis of tuberculous meningitis seems to be incontrovertible. She has collected from the literature, up to 1932, 72 examples of cured tuberculous meningitis, where bacteriological confirmation has been possible. It is noticeable, however, that in many of the examples there is no record of the time which has elapsed between the acute illness and the time of report. In 6 cases a fatal relapse occurred within one year. Where a note exists as to the duration of the 'cure', the most striking feature has been its brevity. One case was actually described as 'cured' after an interval of one month; there were, however, two instances where the patient remained well for two and a half years and one for four years (Wiese). In the author's own series of cures, there were 15 patients aged from 5 to 36 years. Tubercle bacilli were isolated from the cerebrospinal fluid in every case. Two adult patients succumbed to a relapse after intervals of three years five months, and two years eight months, respectively. The thirteen others were alive after intervals ranging from sixteen months (2 cases), eighteen months (2 cases), twenty months (2 cases), two years (2 cases), twenty-seven months (1 case), thirty months (1 case), three years (1 case), to four years (1 case).

All cases were treated by 'Allergine', a phosphatid extract made from special tubercle bacilli selected on account of their properties of solubility. The bacilli are carefully sterilized at low temperatures. According to the author, allergine differs from other bacterial preparations, in particular tuberculin, on account of three characteristics—namely, its colloidal properties, its thermolability, and its toxicity and allergizing power in healthy animals. Allergine, when injected subcutaneously in therapeutic doses, provokes a local reaction, a varying degree of general reaction, and a focal reaction. According to the author it is owing to the last-named that allergine is of therapeutic avail. Cases considered unsuitable for allergine are those old-standing phthisical

subjects in whom meningitis is a terminal event, and cases of meningitis which have been recognized too late and are already moribund, comatose, and incontinent. The author recommends that treatment with allergine should be started as soon as possible and without waiting for the laboratory report on the spinal fluid. Should the clinical diagnosis of tuberculous meningitis prove to be incorrect, no harm will have been done by the allergine. Mercury should never be prescribed to patients who are being given allergine, and in those difficult cases where there is a question of syphilitic versus tuberculous meningitis, the initial treatment should comprise allergine rather than mercury.

Dosage is an individual problem, but the initial dose recommended is the subcutaneous injection of 0.5 c.c. in an adult and 0.25 c.c. in a child. Within the following ten hours a lumbar puncture will be advisable on account of the reactionary increase in cerebrospinal pressure. **Morphia** also may be required at this stage. A second injection of allergine should be given forty-eight hours after the first, the dosage being either the same or even a little less than the original. No further injections are given during the next five days, but the allergine may then be prescribed every five days in doses of 0.25 to 0.5 c.c. until convalescence. Treatment should not be abandoned too soon at this stage, for relapses may occur.

REFERENCES.—*Amer. Jour. Dis. Child.* 1932, xliii, 32; ²*Etude et Traitement de la Ménin-gite tuberculeuse*, 1933, Paris, Masson.

MENTAL DISORDERS. (See also INSANITY, SUDDEN; PSYCHOTHERAPY.)

MENTAL DISORDERS IN TWINS.

H. Devine, M.D., F.R.C.P.

A. J. Rosanoff¹ observes that we find in the medical reports of mental disorders in twins not only that the total amount of material reported is surprisingly scant, but also that interest has seemed to be directed almost invariably to cases in which both twins were affected; and that often without special reference to whether the twins were monozygotic or dizygotic. In other words, this kind of material has never been collected in sufficient amount and in such a way as to afford a real opportunity for comparing the two types of twins. Rosanoff has undertaken an investigation for the purpose of collecting a large enough number of cases of mental disorders in twins to be suitable for statistical treatment, at least in connection with the commoner groups of constitutional mental disorders. He has interested himself in cases in which only one of the twins is affected and not only in cases in which both are affected. In addition, he is interested in monozygotic as well as in dizygotic twins, including opposite-sex twins.

The problem presents certain difficulties, the principal one being due to the fact that there is no large collection of twins affected with mental disorders to be found in any one limited area. The aim of Rosanoff is to gather material from every part of the United States and Canada. Obstetricians report that approximately 1 birth in 80 is a multiple birth. There is, however, a high mortality among twins, and it is quite doubtful if we can expect to find, say, in the state hospitals more than 1 patient in 250 who has a twin brother or sister living somewhere and accessible to investigation. The writer has interested himself in cases of constitutional mental disorders, and also in alcoholism, drug addition, criminal careers, juvenile delinquency, and other serious social maladjustments which may occur on the basis of underlying psychiatric conditions. Accordingly, he has looked for his material first of all in state hospitals, institutions for feeble-minded, and penal institutions; and he expects to find some of it in classes for subnormal children in

public schools, among behaviour cases in the schools, and in child-guidance clinics.

Up to the present Rosanoff reports on 127 cases (255 individuals, there being one set of triplets represented in this material). According to clinical groups these cases are classified as follows :

CLASSIFICATION	No. OF CASES
Monozygotic, both affected	41
Monozygotic, one affected	7
Same sex, dizygotic, both affected ..	18
Same sex, dizygotic, one affected ..	18
Opposite sex, both affected	9
Opposite sex, one affected	34

Interesting comparisons may be made of different clinical groups—for example, mental deficiency and psychotic disease (including schizophrenia and manic-depressive psychoses).

	MONOZYGOTIC		DIZYGOTIC			
	Both Affected	One Affected	Same Sex		Opposite Sex	
			Both Affected	One Affected	Both Affected	One Affected
Mental deficiency ..	19	0	6	7	6	11
Psychotic disease ..	9	4	3	5	1	12

In the six cases of epilepsy both are affected in one pair of monozygotic twins, and only one is affected in each of the five pairs of dizygotic twins (same and opposite sexes). In the two cases of Mongolian imbecility both are affected in one pair of monozygotic twins, and only one is affected in the other pair which are dizygotic. One case of drug addiction in twins happens to have occurred in monozygotic twins, and both are affected. An interesting contrast seems to exist between cases of criminalism in adults and delinquency in children, especially if we include in the latter behaviour disorders which fall short of actual delinquency. In the children both twins are usually affected, whether they are monozygotic or dizygotic. To a somewhat lesser extent this is true of opposite-sex twins. In adults both twins are much more apt to be found affected in monozygotic than in dizygotic pairs.

Considerable difficulty is experienced at times in determining whether a given pair of twins of the same sex is to be considered monozygotic or dizygotic. In fact, in a good many cases this distinction cannot be made with complete certainty. It seems inevitable that errors will be made in both directions. Rosanoff believes, however, that when sufficient material has been gathered in large enough amount for statistical treatment the percentage of error will not prove so great as to obscure or invalidate the conclusions.

In the discussion of this paper M. Wolfsohn refers to a case of identical twins exactly 14 years of age who became afflicted with manic-depressive psychoses of the same type and severity, who were placed in different mental hospitals about three miles apart and had had no communication whatsoever for three years, committing suicide in the same way within a short time of each other. Such a case is certainly a most striking example of heredity. From the physical standpoint one can understand this when one considers that in growth

the chromosomes divide longitudinally and not vertically, so that one can conceive how all the inheritable factors are present in each and every cell. Therefore when the cleavage occurs which results in two individuals instead of one, one would expect all the inherent characters present in one to be present in the other, even to the texture and convolutions and pattern of the brain. It is not to stretch one's imagination too far to consider that the same association trends would be present in both brains. Therefore the same innate tendencies to the same reaction type would result.

REFERENCE.—¹*Calif. and Western Med.* 1932, Aug., 101.

MERALGIA PARÆSTHETICA. (See NEURITIS OF THE LATERAL FEMORAL NERVE.)

MESENTERIC CYSTS.

A. Rendle Short, M.D., F.R.C.S.

E. W. Peterson,¹ of New York, reporting five cases operated on successfully, maintains that the condition is worthy of more attention than it has received. It is not very rare, can be diagnosed if thought of, and needs guidance as to treatment. Enucleation is the best operation if it is possible; if not, it is usual to open and drain. This may leave a persistent sinus. As an alternative he suggests removing the greater part of the cyst wall, closing the incision in the mesentery, and bringing the remainder of the cyst into contact with the raw surface of the mesentery. J. O. Warfield,² of Washington, describes two successful cases in children, and gives the following table of published results since 1920.

OPERATION	CASES	CURED	RECOVERED	DIED	RESULT UNKNOWN
Enucleation	56	42	—	5	9
Enucleation with resection	22	14	—	6	2
Marsupialization	15	11	—	1	3
Drainage	5	2	—	3	—
Aspiration	4	—	3	1	—
Laparotomy	24	8	2	5	9
Autopsy	3	—	—	3	—

The cyst is often too large or too small for confident diagnosis, but it may be suspected when there is a rounded, smooth, not tender, and quite mobile cystic swelling in the abdomen. It is more painful than other abdominal cystic tumours.

REFERENCES.—¹*Ann. of Surg.* 1932, Sept., 340; ²*Ibid.* 329.

MESENTERIC INFARCTION.

A. Rendle Short, M.D., F.R.C.S.

That this condition is not so hopeless as is generally believed is shown by a report of three cases recovering after operation (Julian Smith,¹ of Melbourne). In one the bowel was judged to be viable, and nothing was done; in a second an ileostomy was made above the congested coils of intestine, and pain controlled by morphia; in the third 9 ft. of ileum were resected.

C. Clavel and V. Melnotte,² of Lyons, warn against the statement in the text-books that these cases pass blood per rectum. In moribund patients it may be seen; in cases that are capable of operative cure the signs are those of acute intestinal obstruction. They record a successful resection.

REFERENCES.—¹*Australian and N. Z. Jour. of Surg.* 1933, Jan., 309; ²*Presse méd.* 1932, July, 1190.

MIGRAINE.

Macdonald Critchley, M.D., F.R.C.P.

Within the past two years various papers on the subject of migraine have testified to the obscurity still attached to this interesting and common malady. Thus there have appeared analyses of series of personal cases by R. H. Elliot¹ and by M. Critchley and F. R. Ferguson.² There has also been published a detailed survey of the literature of the subject by H. A. Riley.³ Several other contributions have been made to particular aspects of the semeiology or treatment of migraine.

Elliot's paper dealing with a personal series of 300 cases of migraine emphasizes the diversity of symptoms in different people. In the author's experience headache was primarily unilateral in only 55.66 per cent; nausea with or without vomiting occurred in 74.66 per cent; hemianopia was present in only 18.33 per cent; while zig-zag or fortification signs were seen in 25 per cent and always indicated a markedly severe type of migraine. A very interesting account is given of various hallucinatory experiences as narrated in the Bible and other early historical writings, and evidence is brought to suggest their migrainous nature. The mystical drawings of the Abbess Hildegard, made in the beginning of the twelfth century, are particularly suggestive. Discussing the possible mechanisms of migraine, the author envisages the attack as a vasomotor storm of constrictor nature. In his opinion the most common releasing factor is to be found in an error of refraction. Meticulous correction of refractive errors and of muscle imbalance is the key to the cure of migraine, and must not be omitted from the other adjustments of the physician in the domain of environment and dietary.

Critchley and Ferguson regard migraine not as a clear-cut and isolated disorder, but rather as a symptom which can appear in a person of a specific constitution as a response to many different circumstances. This migrainous constitution is a transmissible characteristic and is very widely spread throughout the community. According to the morbid circumstances which evoke overt symptoms we may speak of ocular, cerebral, metabolic, allergic, biliary, psychogenic, and endocrine types of migraine. The classical triad of headache, followed by vomiting, and preceded by teichopsia, is not the sole criterion of migraine, and the diagnosis can and should be made in cases where part only of this triad is present. Numerous and atypical forms of migraine occur, and in this way migraine would constitute one of the commonest maladies encountered in practice. Among the atypical varieties of migraine the authors mention: (1) *Status hemicranicus*, where one attack follows another without a complete interval of freedom; (2) *Migrainous neuralgia*, where attacks of severe facial pain accompany or follow the typical attack; (3) *Migraine equivalents*, where an episode of psychical—less commonly physical—disturbance replaces an attack of migraine; and (4) *Migraine major*, which includes severe and dramatic attacks, wherein the patient is severely prostrated or debilitated, or where epilepsy, syncope, or unconsciousness forms a part of the migrainous attack. The authors also discuss *persistent paralytic manifestations* which may develop in a case of long-standing migraine. These include persistent hemiparesis or hypæsthesia, persistent hemianopia, oculomotor paralysis (= migraine ophthalmoplégique), persistent mydriasis or miosis, and persistent scotomata (Harrison Butler⁴). From their clinico-pathological studies of the migrainous seizure they emphasize two interesting features: (1) The finding of a low cerebrospinal pressure during the attack; and (2) The frequent occurrence of a low blood-sugar level at the commencement of an attack.

Biliary Migraine.—An association between migraine and disorders of the biliary apparatus is no new idea, and French writers in particular have

attempted to inculcate the gall-bladder in the causation of classical migraine. More recently, fresh studies have clarified the position somewhat. In his Goulstonian Lectures C. E. Newman⁵ drew attention to the resemblance of migraine to the symptoms of so-called dyskinesia of the gall-bladder, a nervous disorder of tonus, and to the suggestive value of atropine in both conditions. Still more recently, T. C. Hunt⁶ has investigated cases of bilious migraine. Out of 27 cases where vomiting was a particularly marked feature, in 19 there were abnormal findings by biliary drainage (70 per cent), and 9 out of 18 cases (50 per cent) gave abnormal cholecystographic records. Evidence of stasis in the gal. bladder was found in 7 out of 27 patients examined by biliary drainage. Hunt found that a higher proportion of migrainous patients as a whole show evidence of gall-bladder disorder than normal subjects. Local gall-bladder disease or dysfunction, he concluded, is not a cause of migraine, but may occur as the result of repeated migrainous attacks, or of some primary underlying hepatic or constitutional cause. Some hepatic dysfunction may be a cause of migraine in certain cases. The primary lesion in many cases is a subacute hepatitis, resulting from the absorption of toxins or bacteria from the bowel or other sources of infection. Such hepatitis may allow the passage of organisms into the gall-bladder, causing chronic cholecystitis or the formation of gall-stones, and may be unrelieved by the removal of the diseased gall-bladder unless the source of infection is also attacked.

Abnormalities around the Sella Turcica.—A certain number of writers have envisaged in the migraine attack the results of temporary swelling of the pituitary body, exerting pressure on adjacent structures (Keyl, Plavec, Leopold Levi, Kast, Timme). Little or no evidence had been brought forward to support this hypothesis until E. D. Paulian⁷ demonstrated periosteal abnormalities at the base of the skull in 5 cases, most marked around the clinoid processes. To these changes he attached importance in the causation of the migraine. W. Timme,⁸ a year later, also spoke of finding radiological abnormalities around the sella turcica, especially ossification of the interclinoid ligament. In 1932, A. P. Thomson⁹ reopened the question by finding in 17 out of 25 patients, with intermittent headaches occurring at the time of menstruation, radiological evidence of abnormal ossification around the sella. In 9 cases there was complete ossification of the interclinoid ligaments, and incomplete ossification in 2 others. He believed that this feature was associated with a stronger development of the diaphragma sella.

This last work obviously suggests several important questions: (1) Are the author's cases examples of migraine? (2) How often does this bony abnormality occur in normal subjects? (3) How often does migraine occur without abnormal radiological appearances around the sella? (4) Does interclinoid ossification necessarily indicate a well-developed diaphragma sellæ? (5) Does such an interclinoid ossification and/or a well-developed diaphragma sellæ interfere with any possible expansion of the pituitary body? and (6) Is there any factual relationship between compression of the pituitary body and the causation of migraine? Some of these queries can be answered. By those who regard migraine as a symptom-complex of frequent occurrence, Thomson's cases of intermittent headache would be certainly regarded as migrainous. We already possess sufficient evidence to say that interclinoid ossifications may occur in non-migrainous subjects, and also that menstrual migraine can occur without radiological abnormalities around the sella. Whether this change is more frequently met with in association with migrainous subjects is not yet clear. There is no obvious reason why interclinoid ossification should indicate a well-developed diaphragma sellæ, and such ossification alone certainly does not interfere with any possible expansion of the hypophysis.

Lastly, the relationship between compression of the pituitary body and the production of migraine is quite unproved and is indeed improbable.

If it can be shown, as it may well be, that bony anomalies around the clinoid processes are present in a striking proportion of cases of migraine, other adjacent structures besides the pituitary may be more intimately associated with the migrainous symptoms.

Hydrocephalus and Migraine.—Among the many speculations which have been made to explain the cause and mechanism of migraine, there is one which has frequently been copied from one text-book to another. This is the theory of Spitzer as to the rôle of chronic or intermittent hydrocephalus. It is perhaps insufficiently stressed that this hypothesis is also entirely without anatomical support.

Migraine and the 'Periodic Syndrome' of Childhood.—B. Schlesinger and W. G. Wylie¹⁰ point out that the classical symptoms of migraine or of a bilious attack—as occurring in an adult—are apt to be represented in childhood by recurring attacks of extreme clinical diversity. To describe these paroxysmal affections the authors have coined the term 'the periodic syndrome'. Within this group belong such disorders as attacks of headache, vomiting, fever, and abdominal pain; various diagnostic labels are often attached—'biliousness', 'migraine', 'feverishness', or 'cyclical vomiting'. Other manifestations of the periodic syndrome occur less frequently: dizziness, faintness, tinnitus, blurred vision, and attacks of unconsciousness. The first appearance of any of these variants of the periodic syndrome naturally provides a problem in diagnosis, but their recurrence should serve to indicate their nature. Symptoms of the periodic syndrome first appear before the age of 3, and tend to disappear after the first decade. They often reappear in adult life as migraine. From their series of 80 cases the authors have noted several interesting clinical and biochemical features. Elevation of blood-pressure has been observed in association with attacks of headache and giddiness. The patients are often of slim build, quick, active, alert, and 'highly strung'. There is often a family history of allergic disorder, rheumatism, asthma, migraine, and biliousness. The treatment proposed by the authors includes a **Diet** low in fat and rich in carbohydrates. **Glucose** in a dosage of 2 to 4 drachms thrice daily, though commonly prescribed, is often disappointing. Refractive errors, tonsillar sepsis, and protein sensitivity (as revealed by skin reactions) should be treated *secundum artem*. To ensure regular action of the bowels, a **Bicarbonate**, **Rhubarb**, and **Senna Mixture** is advised thrice daily. For the relief of severe headache, **Luminal** or **Thyroid** in small doses is suggested.

TREATMENT.

It is perhaps most useful to describe the therapeutics of migraine under two heads—namely, treatment between the attacks, and treatment of the attack itself. Of the former, the adjustment of faulty dietary is important; avoidance of excessive mental fatigue and stress; of physical overexertion; of eyestrain; of prolonged confinement in hot stuffy atmosphere; of irregular habits; of states of hunger as well as of overeating. Special attention must be paid to the full correction of errors of refraction, however slight, and to ocular imbalance. This care forms, indeed, an essential part of the management of the migrainous patient.

Special measures are indicated in the various types of migraine. In the bilious varieties, Hunt recommends **Bile Salts**, given as capsules of sodium glycocholate in doses varying from 2 to 20 gr. thrice daily; or the proprietary preparation **Decholin** (1 to 6 tablets daily after food) may be prescribed. For the menstrual types of migraine, various ovarian or placental preparations are

recommended. Thus **Theelin** injections (1 c.c. or 50 rat units) may be given three times during the week preceding the menstrual period (Thomson). Or **Emmenin Complex** (Glaxo) $\frac{1}{2}$ to 1 drachm twice a day (except during the menstrual period) may be prescribed. Other endocrine preparations are at times employed, the most efficacious probably being small doses of **Thyroid** ($\frac{1}{2}$ gr. three times a day). Perhaps the most generally useful drug, however, is **Luminal** given in the form of $\frac{1}{4}$ - to 1-gr. tablets twice daily. D. G. Dickerson¹¹ has treated a series of seven cases of migraine by trephining the skull on the side of the headache and **Ligating and Resecting a part of the Middle Meningeal Artery**. In three of these cases operation was performed for the relief of symptoms after head injury, and the incidental relief to the migraine was noted. In all seven cases striking improvement followed operation.

For the treatment of the attack itself, the patient should not attempt to 'work off' his symptoms, but should lie down at once in a darkened room. Food is usually refused, but a prompt dose of **Glucose** or **Barley Sugar** may at times be efficacious in cutting short a mild attack. In a few instances the attack can be aborted by the **Production of Vomiting**, but such are unfortunately in the minority. As a rule, strong analgesic drugs are the only means of relief. There is considerable individual variability as to the drug, but among the more useful are **Phenacetin** 15 gr. with **Caffeine** 5 gr., **Compral*** (one-two tablets), and **Veganin**† (one tablet). These drugs may be repeated if necessary at the end of half an hour. Hunt draws attention to the value of **Adrenalin Injections** (10 min. of a 1-1000 solution) in the relief of an attack. C. Dejean¹² has lately advocated an injection of **Acetylcholine** 0.1 grm. as a means of cutting short an attack, particularly in those types of migraine where teichopsia and scintillating scotomata are prominent.

REFERENCES.—¹*Post-Grad. Med. Jour.* 1932, viii, 328, 363, and 449; ²*Lancet*, 1933, i, 123, 182; ³*Bull. Neurol. Inst. New York*, 1932, ii, 249; ⁴*Brit. Jour. Ophthalmol.* 1933, xvii, 83; ⁵*Lancet*, 1933, i, 841; ⁶*Ibid.* ii, 279; ⁷*Pcris méd.* 1925, xv, 110; ⁸*Brit. Med. Jour.* 1926, ii, 771; ⁹*Lancet*, 1932, ii, 229; ¹⁰*Brit. Jour. Child. Dis.* 1933, xxx, 1; ¹¹*Jour. Nerv. and Ment. Dis.* 1933, lxxvii, 42; ¹²*Presse méd.* 1932, Dec. 24, 1950.

MOUTH AND TONGUE, CANCER OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

J. Fraser¹ deals with this subject exhaustively, and illustrates the site incidence of malignant disease of the buccal cavity (Fig. 73). The maximum incidence occurs in the decade between 75 and 85 years. Thus it is likely that cell instability increases as age advances, so that a stimulus which in younger tissue would pass unnoticed now induces the change that results in malignancy.

TREATMENT.—With regard to treatment, it may be divided into: (1) Excision of the tumour by scalpel or diathermy together with a radical dissection of the related lymphatic field. (2) Radium or X-ray treatment of the local area, combined with radical dissection of the lymphatic field. (3) Radium or X-ray treatment of both the local and lymphatic areas. It is always a problem whether a tumour should be excised first and the glands afterwards or vice versa when operative treatment is contemplated. If we are to judge the operation from the standpoint of recurrence, the fewest recurrences were encountered in cases where a one-stage combined operation was performed.

Fraser appears to favour **Radium** treatment for local growth, and when the surface lesion is healed the glandular tissue on the affected side is dissected. It is probably particularly dangerous to practice glandular dissection during the early stages of radium application to the local lesion. Ten days after the

* Bayer Products Ltd., Africa House, Kingsway, London, W.C.2.

† W. R. Warner & Co. Ltd., 300 Gray's Inn Road, London, W.C.1.

first glandular dissection, tissues of the opposite side are removed. In the course of the dissection 30 to 40 mgrm. of radium are introduced underneath the posterior portion of the digastric muscle.

H. S. Stacy² discusses buccal carcinoma and its treatment. He mentions that a positive Wassermann test does not necessarily exclude carcinoma. Sometimes there is a doubt about the diagnosis of chancre of the lip, and it may be necessary to place reliance on the negative effect of several weeks' treatment on antisyphilitic lines. Actinomycosis must be remembered.

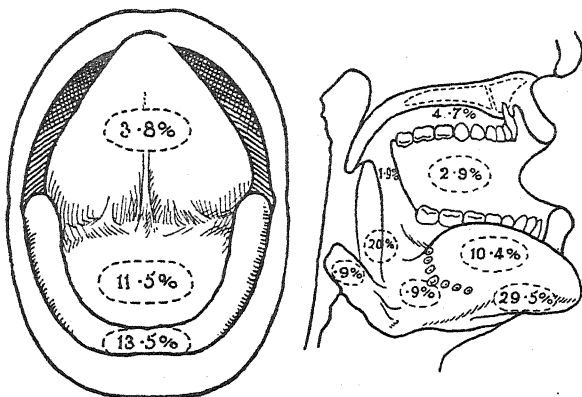


Fig. 73.—Site incidence of malignant disease of the buccal cavity.
(By kind permission of 'Annals of Surgery'.)

In cases of *lip cancer* **Radium** is superior to excision in its cosmetic effects; in curative value it is probably its equal. When the lesion is not a large one there is no virtue in replacing the scalpel. When radium is indicated, it is given in doses of 800 to 1000 mgrm.-hours in needles; a larger dose may be indicated.

Stacy thinks that in the case of the *tongue* when the lesion is early, wide **Excision** is indicated. The second stage of the operation is performed two or three weeks later, when the deep cervical glands and those of the digastric triangle are cleaned out. He does not perform a one-stage operation. He agrees with those who think that glands should be removed second, not first.

In the *more extensive tongue lesions* he thinks it wise to use **Diathermy**, the glands being removed by operation. For tonsil and palate tumours surgery with the scalpel is practically excluded. In such cases diathermy, by its destruction and fibrosis, causes a marked delay in the spread of the growth and it relieves pain. In all cases glands are removed by dissection unless they are extensive and fixed, when massive doses of radium are employed.

REFERENCES.—¹*Ann. of Surg.* 1932, Oct., 488; *Med. Jour. of Australia*, 1933, May 6, 549.

MUMPS.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—In view of the rarity of *pancreatitis* in mumps and especially of fatal cases of this complication, the case recorded by E. James¹ is of interest. The patient was a boy, aged 7 years, who was admitted to hospital moribund ten days after the onset of an apparently mild attack of mumps. The main symptoms were restlessness, repeated

blood-stained vomiting, and a rapid, feeble pulse. The abdomen was not distended, and there was no complaint of pain or tenderness. Death took place soon after admission, and the necropsy showed the macroscopic and microscopic appearances of acute pancreatitis. No other gross lesions were found.

The association of *mumps with diabetes*, though rare, is well known in that mumps may occasionally be followed by diabetes, presumably as the result of pancreatitis. H. Hirsch-Kaufmann² now records examples of the reverse sequence. The patients were six children, aged from 3 to 11 years, who contracted mumps while under treatment for diabetes. Two were treated by synthalin and the rest by insulin. In no instance did considerable or permanent diminution of sugar tolerance arise as the result of the attack of mumps. As in every other infection, even a mild cold, the diabetic patient is liable to develop a transient impairment of metabolism during mumps, but after the attack has subsided equilibrium is soon restored.

J. Donnelly and J. B. Oldham³ record a case of mumps complicated by *appendicitis*. The patient was a boy, aged 7 years, who in convalescence from mumps developed epigastric pain and vomited. A diagnosis of pancreatitis was at first made, but as marked tenderness and rigidity subsequently developed in the right iliac fossa, it was changed to acute appendicitis with perforation and peritonitis. On laparotomy suppurative peritonitis was found and a gangrenous and perforated appendix was removed. Recovery was uneventful. Similar cases have been reported by Simonin (1903), Talaguer (1909), Rosenow and Dunlap (1916), Benassi (1925), and Sandler and Finne (1932).

C. Magi,⁴ who had previously recorded two cases of *glomerular nephritis* in brothers convalescent from mumps, now reports his observations on ten cases of mumps in patients, aged from 4 to 20 years, in whom he carried out tests of renal function. In every case the results of the dilution and concentration tests proved perfectly normal with the exception of one case in which the concentration test showed a subnormal result. Seven days later, however, a perfectly normal result was obtained. Magi comes to the conclusion that glomerular nephritis is only a rare sequel of mumps, due to the infective nature of the disease in subjects who show a special predisposition as regards their renal system.

P. W. Paddock⁵ reports two cases of mumps with *meningitis* in identical twin brothers, one of whom contracted mumps three weeks before the other. The symptoms in both cases were similar, viz., vomiting, headache, nuchal rigidity, and Kernig's sign. The cerebrospinal fluid in each case escaped under slight pressure on lumbar puncture, was sterile, and showed a lymphocytosis, as did also a blood-smear. The symptoms rapidly subsided after lumbar puncture in each case.

PROPHYLAXIS.—H. Cambassèdes⁶ injected 22 children who had been exposed to mumps with from 10 to 20 c.c. of **Convalescent Serum** subcutaneously, and only four subsequently contracted the disease. He also gave injections to 18 other individuals, mainly students, and only one developed a very mild attack of mumps. The serum was also used in the prophylaxis of mumps orchitis as follows: 172 men suffering from mumps were given from 12 to 40 c.c. of convalescent serum, and only 6.97 per cent developed orchitis as compared with 23.29 per cent among 176 controls. Better results were obtained with a dose of 40 c.c. than with the small dose of 12 to 19 c.c. at first used.

TREATMENT.—Martiny⁷ has found that the oral administration of minute quantities of powdered **Lead** triturated in lactose and placed on the tongue every hour, except during meals and at night, aborts the disease in twenty-four hours and causes a rapid disappearance of pain and swelling. The treatment

has no effect on mumps orchitis, but no patient who had been treated by lead developed this complication. The treatment proved quite harmless.

(See also TESTIS AND APPENDAGES, SURGERY OF—ORCHITIS OF MUMPS.)

REFERENCES.—¹*Brit. Med. Jour.* 1933, i, 1130; ²*Jahrb. f. Kinderheilk.* 1933, cxxxix, 82; ³*Brit. Med. Jour.* 1933, i, 98; ⁴*Clinica Pediatrica*, 1933, xv, 744; ⁵*Amer. Jour. Dis. Child.* 1932, xlv, 565; ⁶*Ann. d'Hyg. publ.* 1933, xi, 83; ⁷*Bull. Soc. de Thér.* 1933, xxxviii, 72.

MYOPIA.

Sir Stewart Duke-Elder, M.D., F.R.C.S.

Some years ago, Duke-Elder drew attention to the effect of work involving eye-strain upon the incidence and increase of myopia in young adults. This is a subject of very considerable importance to the general practitioner; and an interesting corroborative paper is now published by M. Rohner.¹ The statistics cover examinations of 11,251 recruits from five cantons and the city of Zurich, Switzerland, for the year 1924-5. The patients were about 19 or 20 years of age, and were grouped both as to occupation and degree of refractive error. The myopic subjects were classified in four groups, according to the degree of myopia: up to 3, from 3 to 6, from 6 to 9, and more than 9 diopters. Comparison of the city- and country-bred revealed a higher percentage of persons with myopia among the former, 8.6 per cent as compared with 3.6 per cent. Students, teachers, tailors, watchmakers, and mechanics doing finer degrees of close work showed from three to four times the percentage of myopia found in farmers and persons of similar occupation. The author concludes that the frequency of myopia is characteristic of the more cultured group, which consisted of individuals more subject to eye-strain. This finding, of course, indicates the danger of excessive close work for progressively myopic children.

REFERENCE.—¹*Schweiz. med. Woch.* 1932, lxii, 706.

NASAL SINUSES, DISEASES OF. F. W. Watkyn-Thomas, F.R.C.S.

SUPPURATIONS OF THE NASAL SINUSES.

'Ten Commandments for Sinus Sufferers'—M. J. Mandelbaum¹ has laid down commandments which are so simple and so practical that they are quoted here *in extenso*. He reminds us that these conditions are often far more than a simple local infection. Exposure to heat or cold, excessive atmosphere dryness or moisture, local and general resistance, 'familial catarrhal dyscrasia', sensitivity to specific organisms, and many other unknown factors may all play an important part, and, as he rightly says, the sufferer is too willing to lay all the burden of his cure on the doctor. Again and again he found that a 'set-back' or an acute exacerbation was due to some one simple cause, and so he has a printed card which is supplied to all patients with sinusitis. The 'commandments' are:—

"1. *Do not wet your hair* on leaving your home in the morning, particularly in cold weather, as sudden chilling can cause congestion of the nose, resulting in a sinus attack. If you must use something to keep your hair in place, use plain petroleum jelly or one of the many excellent preparations now on the market for that purpose.

"2. *Do not swim or dive*, especially the latter. They are dangerous pastimes for sinus sufferers as well as those suffering from ear trouble. They may bring on acute attacks in those predisposed and in chronic sufferers bring on acute recurrences.

"3. *Do not get wet feet*, as 'catching cold' may bring on an attack of sinus trouble. Wear thick soles in cold weather and rubbers in wet weather. Thin

paper-like soles of evening slippers may be fashionable for debutantes but are also friendly to undertakers.

"4. *Do not smoke or drink* during acute sinus trouble. Those susceptible to such attacks and chronic sufferers as a rule should indulge very moderately. Better yet, not at all.

"5. *Do not go without a hat* except in the midsummer months and not even then too long in a very hot sun. Uncovered heads in fall, winter, or early spring, needlessly subject thousands to attacks of sinusitis and other respiratory diseases.

"6. *Do not stay in a draught* either while asleep or awake. Most people who catch cold easily and especially those subject to sinus trouble are susceptible to air currents. Running out of a hot room into the cold open air without a covered head and a proper weight overcoat just for a moment not infrequently induces a severe head cold, and lays the foundation for a sinus attack. Going into the open air in cold weather while perspiring is likewise to be condemned.

"7. *Do not over-indulge in food*, as too much food overloads the bowels. An overloaded colon in many individuals is a source of reduced vitality and lowered resistance. Daily action of the bowels is important in sinus sufferers, as thus a large amount of swallowed nasal discharge is swept out of the intestinal canal.

"8. *Do not take cold shower baths* in the morning, particularly in cold weather, unless you protect your head with a rubber cap. If you must do so, do not leave the house before your body is warm. Better still, bathe before retiring.

"9. *Do not wear summer underwear* in the late fall, winter, or early spring. Animals grow thicker hair in the cold months, and shed it in the warm months. Humans cannot, so we must change the weight of our underwear according to the season. Wool or woollen mixtures in various weights should be worn for the cooler periods.

"10. *Do not neglect your general health*, as the condition of your mind, nerves, skin, teeth, stomach, intestines, etc., all indirectly influence your sinus condition. Health constitutes the proper functioning of every bodily organ, not only individually, but is that finely balanced co-ordination of each of the many bodily systems in relation to each other, and to the whole. Lowered general health can in the susceptible induce sinus disease, and, vice versa, sinus disease can affect the general health."

[Reverse side of card.]

"To restore your nose to a healthy condition involves a double responsibility; the doctor's and your own. With the proper co-operation of both, satisfactory results may be expected.

"Medical as well as home care is but a part of the treatment necessary for improvement. Attention to the hygienic details listed on the reverse side of this card is equally important.

"In many cases where supposedly permanent relief has been attained, the breaking of these 'commandments' has resulted in an unexpected attack.

"Our local climate with its violent weather changes may suddenly induce an occasional sinus attack, despite the most scrupulous attention of doctor and patient. Such recurrences, however, are usually easily controlled.

"Faithful observance of these rules will materially assist you in avoiding unnecessary future attacks, brought on by weather conditions or other causes."

Osteomyelitis Complicating Sinusitis.—Osteomyelitis is perhaps the most dreaded of all the complications of nasal sinusitis. Fortunately it is not common, but when it does occur the prognosis is of the utmost gravity. H. P. Mosher and D. K. Judd,² in an analysis of seven cases of osteomyelitis of the frontal bone complicating frontal sinusitis, review the problem fully. They point out as a start that osteomyelitis of the upper jaw seems to be amenable

to conservative surgery. In such cases the majority of the patients have recovered when surgical intervention has been limited to removal of diseased bone and sequestra. Unfortunately the results of osteomyelitis of the frontal bone are very different; of the 7 patients on whom the authors report, 3 died. [In two of these cases no autopsy was permitted, but it seems clear that the patients died of meningitis. In the third case a limited post-mortem examination was allowed and a large extradural abscess with thickening of the dura, infiltration and œdema of the piaarachnoid, and œdema of the brain was discovered. No cerebral abscess was found. Taking these results with the high temperature and papilloœdema, a suppurative encephalitis seems the most likely cause of death.—F. W. W.T.]

In all cases *Staphylococcus aureus* was the infecting organism. All the patients were young, the oldest 36, the others from 11 to 24, which supports the view that the more vascular and open diploë of the young is more liable to spreading infection. In all these cases osteomyelitis was proved to be present at the first operation, but it certainly can follow any operation which exposes raw surfaces of the bone to direct invasion, however small the operation may be, either in acute or chronic cases. The infection spreads more easily through spongy bone, but, as D. McKenzie³ has shown, spongy bone is not necessary for the spread. It can spread through the thin hard bone of the ethmoid and lachrymal and of the orbital plate. Probably there are two routes of spread, by direct infection through the mucosa to the underlying walls, and by thrombophlebitis through the vessels of the periosteum and Haversian canals.

It has been said that the suture lines can act as a barrier, but in adult life the diploetic veins communicate across the sutures, and even in children infection can spread from bone to bone by vascular channels. The infection is rarely limited to the bone, but progresses along the dura, periosteum, and scalp at nearly the same rate. The dura is soon inflamed, and when the inner table gives way an extradural abscess is formed. The authors state that the extradural abscesses in their cases did not extend beyond the limit of the infected bone. [This finding is of particular interest when we compare the condition with the extradural abscesses which sometimes follow zygomatic mastoiditis and may be found some distance away from the nearest infected bone.—F. W. W.-T.]

Two facts stand out strongly: (1) Œdema means infection of the medulla and of the periosteum, and they run a parallel course. The extent of the œdema is a practical guide to the limit of infection of the medulla. (2) Microscopic sections show that if the X-ray shows bone necrosis the surrounding bone is infected for an inch to two inches beyond the area of necrosis. Œdema is the first sign; the X-ray shows necrosis, not infection, and the positive X-ray signs may not appear until seven to ten days after the œdema. A week spent after the appearance of œdema, waiting for X-ray evidence, is a week wasted.

TREATMENT.—"Osteomyelitis writes across the patient's brow not only the diagnosis but the treatment." The authors are in full agreement with McKenzie that the treatment must be early and radical. They agree, too, that operation for osteomyelitis must be from above downwards—that is to say, it must be started in normal bone well above the infected area, so as to avoid contact infection of the healthy diploë. For practical purposes the limit of the œdema corresponds to the limit of bone infection, so the removal of bone must be started well above the limit of the œdema, and, as it has been shown that infection spreads far in advance of necrosis, at least two inches above the level of necrosis. The authors rightly say that 'now or never' should be the surgeon's attitude at the first operation. With each secondary operation

the patient's chances are diminished. His resistance is increasingly lowered by infection and the danger of intracranial complications steadily increases. If both frontal sinuses are infected, the whole area must be excised, and it is of the utmost importance that the inner table should be removed as freely as the outer adequately to expose the dura. Mosher remarks that it is not difficult to separate the longitudinal sinus from the bone if we start at the upper limit of the frontal sinus where the longitudinal sinus is only a fibrous cord. McKenzie uses a curved skin flap with the convexity upwards, but Mosher prefers two triangular flaps with an incision in the mid-line and a cross incision above the eyebrows. He lays great stress on the lateral extension of infection into the external angular process of the frontal.

Attention is drawn to the great value of **Blood Transfusion** in these cases. The authors advise that a donor for transfusion should be in readiness at all operations for osteomyelitis.

Use of Local Agents to Increase Tissue Immunity in Sinus Mucosa.—

R. A. Fenton⁴ groups local measures for such a purpose as physical and chemical, and, from the pharmacological point of view, into those altering the surface tension of the cells in the mucosa and those having bactericidal powers.

Cold, by ice-bags and cold packs, may often be a valuable aid in cases where orbital inflammation from the fronto-ethmoidal region is anticipated; but it has the grave disadvantage that it may increase the neuralgic pains, and possibly, by constriction of the vessels, it may diminish the local reaction dangerously. In some cases undoubtedly a quiet sinusitis may flare up after exposure to cold.

Heat has disadvantages of another kind. The careful use of 'infra-red' heat lamps may give great relief to pain; but excessive heat, just because it increases the circulation and local reaction, increases swelling and exudation and so increases obstruction and pain. The membranes affected are enclosed in rigid-walled cavities, and compensatory distension is not possible. Therefore diathermy, which has considerable penetration, should only be used under the most careful and skilled control.

Irradiation was first tried by Thost, thirty years ago, and for a time the method was popular, as it was said to cause shrinkage of polypi in ethmoiditis as well as to relieve pain. The method has since been seriously criticized, and Fenton warns us that it may have retarding or even destructive effects. X rays destroy lymphocytes which are essential for mucosal healing, and endarteritis and fibrosis are frequent results of prolonged irradiation. If so, it cannot be said to raise the tissue immunity. Radium bombardment may cause necrosis and sequestration of the turbinals and ethmoidal walls.

Introduction of medicaments into the sinus cavities may be carried out by direct injection either by puncture or through a natural ostium, or by the displacement method of Proetz, which was described in the last volume of the *MEDICAL ANNUAL* (p. 311). [Apparently Fenton shares in the doubts expressed by Hodgson as to the efficacy of the method, to which reference was made in the same article.—F. W. W.-T.]

A discussion on the action of various substances on the mucosa is perhaps the most valuable part of the work. For all cells the chlorides of sodium, potassium, and calcium are necessary. For special activities other salts are needed. Ciliary activity, which is necessary for normal sinus function, is paralysed by sodium iodide and is inhibited by sodium chloride; on the other hand, it is increased by the salts of magnesium, barium, and calcium. Increased permeability of the capillaries in inflammation is helped by calcium. Preparations from which free chlorine can be released are far too irritating to the mucosa.

The question of surface tension is most important. Hypotonic solutions impair resistance by abstracting salts from the tissues; too strong solutions damage the growing cells. Oils are far better than colloid solutions—gums and jellies—which inhibit ciliary action.

Mercurochrome and metaphen can only be used for short periods because of their irritant effects. Besredka's 'mass vaccines' have been extensively tried, but they seem useless for streptococcal infections, although sometimes valuable against the staphylococci. They have the grave disadvantage of uncontrolled dosage, and occasionally serious 'negative phase' effects have been reported.

Fenton concludes: "Too often the sufferer from accessory sinus disease is suffering from lowered resistance which is due to causes not at all local in origin. It is folly to expect increased immunity from purely local measures, whether physical, medical or surgical, unless the general or constitutional basis is altered for the better."

MALIGNANT DISEASES OF THE NASAL SINUSES.

In the last number of the MEDICAL ANNUAL (p. 19) the present writer stated that in malignant disease of the nose "the weight of opinion was inclining towards ray treatment in preference to surgery." This position has been rendered untenable by the publication of L. G. Ohngren's⁵ monograph *Malignant Tumours of the Maxillo-ethmoidal Region*. This is the most complete study of the subject that has ever been issued. In ten years (1922-31) 187 cases of malignant maxillary tumours were treated by Ohngren in Professor Holmgren's clinic at the Sabbatsberg Hospital in Stockholm. A few of these cases came from other countries, but far the most of them from Sweden. The collection of such a large series of cases in a country with a population of six million is explained by admirable organization. All patients with suspected tumours of the sinuses were sent from every hospital in the country to the Sabbatsberg, and special arrangements were made with the local authorities—the village magistrate or clergyman in outlying parts—for the supply of free railway passes so that the patients could return for periodical examination.

Statistics show that the incidence in men and women is roughly equal, that there is a rapid increase in the frequency of the tumours in the fourth and fifth decades of life, and a rapid fall after the sixth decade. The type of tumour was carcinoma in 145 cases, sarcoma in 29, and 'malignant mixed tumour' in 13. Squamous-celled carcinoma, with or without cornification, was the most common growth. Ohngren has not included in the series any cases of "sarcoma-like tumours originating from the bony system, the malignancy of which may be questioned". The 'malignant mixed tumours' include all tumours with salivary gland structure. Ohngren does not definitely commit himself to one or other of the views on their etiology, but on the whole he regards them as epithelial rather than endothelial in origin.

Of the whole series all but 38 (20.1 per cent) were treated by operation, with or without radiation. These figures must be contrasted with those of Gordon New,⁶ where, of 168 cases, 71 (42.3 per cent) were regarded as inoperable.

In his classification of growths for clinical purposes Ohngren uses an ingenious scheme constructed on *site*, *histological malignancy*, and *metastases*. Tumours below and in front of a plane drawn through the inner canthi down and back to the mandibular angles ('malignancy plane') are by their anatomical position less rapidly able to reach inaccessible points than tumours above and behind the plane. These are further subdivided into medial and lateral. Of

these the most harmless are the antero-inferior medial, and the most dangerous are the postero-superior medial, which can easily and quickly reach the cribriform plate and the meninges.

His histological groups for malignancy are in ascending order: (1) Basal-celled carcinoma and adenocarcinoma arising from mixed tumours, myxomatous sarcoma, and papillomatous carcinoma; (2) Squamous carcinoma with moderate cell-polymorphism and abundant mitoses, basal-celled carcinoma not arising from mixed tumours, and the majority of sarcomata; (3) Carcinoma of immature type with marked cell-polymorphism, and melanosarcoma.

TREATMENT.—The method of treatment is a resolute **Excision of the Growth by Diathermy**, with or without radium and X-ray irradiation. For this excision a diathermy machine of a special kind is needed, as the whole operation from start to finish is done without any knife incision or dissection.

1. With a low current, high voltage, and very high frequency the tissues can be 'split' with so little coagulation that they can be sutured safely after the operation. This is 'electrotomy', and is used for making the incisions in the skin and superficial tissues.

2. With lower frequency and a stronger current raw surfaces are coagulated and bleeding arrested, but the portion of the wound so treated must not be sutured. This is 'coagulotomy'.

3. With a strong current of low voltage with both terminals in the wound we have 'boiling' of the tissues (electro-coagulation), which is used for the destruction of the tumour and the division of bone (e.g., of the palate or of the walls of the antrum). This 'boiling' should not be carried to the point of carbonization during the operation, or the full deep effect of the heat will not be obtained, but when the operation is over Holmgren advises carbonization of the raw surface by a still stronger current in order to obtain a dry gangrene of the surface, which will then not be so readily infected. ['Fulguration,' or unipolar sparking carbonization, is rarely used now at the Sabbatsberg Clinic.]

A point on which Ohngren lays great stress is that we must be prepared to risk considerable deformity by excision of infected or adherent skin. The first essential to success is absolute destruction of the growth, the second is absolutely free drainage. For this reason he freely excises the palate, as has been recommended by Douglas Harmer⁷ on the same grounds. The gaps are afterwards repaired by more or less extensive plastic operations. Ohngren uses the 'tube flap' of Gillies. He now takes his flap from the back of the shoulder, not from the chest, as he has found the skin of the shoulder richer in fibrous tissue. With such a flap he has repaired the defect in the palate as well as in the cheek. Forehead flaps are sometimes used for repair of the lids, and the raw surface of the forehead is repaired by a Thiersch graft.

As a supplement to this operation by electro-surgery, in the majority of cases (94) **Radium** has been inserted into the cavity, and in many cases deep **Roentgen Treatment** has been added, sometimes as a pre-operative measure. In 29 cases electro-surgery was used alone; in 21 electro-surgery with pre- and post-operative radiation, but without insertion of radium. The figures at present seem to show that the cases treated by electro-surgery alone did quite as well in the long run as those in which the combined methods were used, but, as Ohngren very fairly points out, these were, on the whole, the least malignant cases, so at this stage judgement must be suspended as to the value of ray treatment as an adjuvant.

A few practical points must be considered:—

As a rule Ohngren ties the external carotid at the time of operation. The ligature should be above the origin of the superior thyroid, in order to prevent

thrombosis down to the bifurcation, with the risk of embolism of the internal carotid.

Post-operative cerebral complications, in Ohngren's opinion, have been increased by the use of radium. This applies to cerebral œdema and abscess, but not to meningitis, which is usually a direct spread from injury.

Injuries to the eye, if early, are probably the result of the excessive heat necessarily used at the operation; if late, of the radium treatment.

Late hæmorrhage (two months after operation) usually occurs in the sphenoidal region and sometimes from the cavernous sinus. It is suspected that this is a radium necrosis. Chest complications are rare, and only one case of embolism occurred. Erysipelas, on the other hand, is difficult to avoid, especially in areas exposed to radiation.

The total results show that five years after commencing treatment 30·8 per cent of patients are absolutely symptom-free. Of those who have not yet reached the five-year interval, 44 per cent are free after two years, and 40 per cent after three years. These are by far the best results yet obtained over a long period and a large number of cases; moreover the proportion of patients rejected as 'inoperable' is so low as to prove that no special selection has been used. The findings must be accepted as absolutely fair.

REFERENCES.—¹*Laryngoscope*, 1932, xlii, 710; ²*Ibid.* 1933, xliii, 153; ³*Jour. of Laryngol.* 1927, xlii, 293; ⁴*Jour. Amer. Med. Assoc.* 1932, Dec., 2247; ⁵*Acta Oto-Laryngol.* 1933, Supplementum xix; ⁶*Arch. of Otolaryngol.* 1926, May 26, 461; *The Semon Lecture*, 1931.

NATIONAL HEALTH INSURANCE PRACTICE.

E. Kaye Le Fleming, M.A., M.D.

Before the passing of the National Health Insurance Act of 1911 only a very small proportion of the industrial population of this country made any provision for medical treatment in time of sickness, nor could the provision so made claim to be sufficient or satisfactory. Hitherto the State had been content to provide for the destitute, but the growing need for an improved health service and the recognition of the economic value of the health of the industrial population was rapidly commanding attention. Hence the great aim of the Act was to make provision for the medical treatment (both remedial and preventive) of the whole industrial population, and to quicken the interest of the community as a whole in the value of health.

Such a general statement is advisable before referring to the more strictly medical issues which affect the profession and which is the main purpose of this article. It is not possible to estimate with accuracy the numbers either of the insured or the doctors engaged in the service. There is a constant flow of insured both into and from the scheme, and a doctor may practise in an area where his name appears on two or more Insurance Committee lists. The most reliable computation would place the number of the insured at rather more than 19,000,000, and the doctors at more than 19,000—roughly one doctor to a thousand insured.

National Health Insurance has now been established for more than twenty-one years in this country, and it is a remarkable fact that little or no attention has been given to this subject in Medical Education. The newly qualified practitioner will not only engage in general practice without having had instruction or advice from anyone who has had experience in general practice, but will find himself entitled to contract with the State for attendance on a large section of the population without any knowledge or experience of what the service means.

Before considering the conditions of this work it is worth while recalling the system of contract practice which existed before the passing of the National

Health Insurance Act of 1911, and upon which the Government scheme was in some measure founded.

Medical attendance for their members was provided by the Friendly Societies and Clubs by contract with individual doctors on a capitation basis. The rate varied in different districts, but was extremely low. The reasons which made this work most unpopular with general practitioners were many, but the most important were the totally inadequate remuneration and the ruthless domination of the doctor by the Friendly Society official. Contract practice of this kind had therefore a very bad reputation in the eyes of the profession, and the introduction of the Insurance Act was at first looked upon with great distrust. Apart altogether from the question of adequate remuneration, it was considered by many to be a big step towards a whole-time salaried State Medical Service which would divide the profession into two classes, the panel and non-panel doctor, greatly to the disadvantage of the former. Objection was also taken to the interference of the State in even a part-time service.

Time has shown those fears to have been groundless. The remuneration has varied, but has long steadied to a fairly reasonable level. The large majority of general practitioners are engaged in the work, and there is no difference in standing between them and their fellow-practitioners. The organization of the profession, at first weak but now highly efficient, has secured certain principles which make the existing system above all comparison with the old type of contract practice. These are: freedom from Friendly Society control; adequate remuneration; and free choice as between doctor and patient.

Insurance practice, therefore, at first prejudiced by the evil repute of the form of contract practice which it superseded, has steadily improved in efficiency and reputation, and is now an accepted and welcome part of the routine of most general practitioners. With these brief introductory remarks let us turn to a general survey of the conditions of service.

In the first place it must be remembered that the Minister of Health is responsible in Parliament for the administration of the Act, and has charge of the supervision and control of the service. For administration purposes the country is divided into separate areas, and in each county and county borough there is an *Insurance Committee* charged with the local administration of medical benefit. On this Committee sit representatives of the approved societies, the insured, the doctors, and the local authority. In addition the Act requires to be set up in each area a *Panel Committee* of qualified doctors, of whom three-fourths (in Scotland two-thirds) must be insurance doctors, elected by the insurance doctors of the area. This Committee is available for consultation by the Insurance Committee on points affecting the medical service under the Act. Every registered practitioner has the inalienable right to enter the service, unless his name has been taken off the list as the result of disciplinary action, or he has given an undertaking to the Ministry not to apply.

The doctor who wishes to undertake insurance practice has only to write to the clerk of the Insurance Committee of the area (or areas) in which he practises to ensure that his name will be entered on the list, and all necessary information on administrative details given him. For information on his medical duties, and for advice and help in the same, he should write to the secretary of his Panel Committee, who will always be found ready to give him assistance. As soon as his name is on the list any insured person who wishes to be attended by him may (subject to certain rules affecting insured persons) bring his medical card for signature. The card duly signed is forwarded by the doctor to the Clerk of the Insurance Committee, when the name will be

entered on his list of patients and the card will be stamped with the doctor's name and returned by the clerk to the patient. The doctor's remuneration is paid to him quarterly on the basis of the number of patients on his list on the first day of the quarter.

The Contract of Service.—On entering the service the doctor contracts to give his patients the attention and skill that is expected of a general practitioner. It is in fact up to now a *general practitioner service* only, and the relation between patient and doctor is exactly the same as in private practice. In so far, however, as he has under his contract to perform certain administrative duties, there is a measure of supervision of his work in this respect by medical officers of the Ministry of Health, specially appointed for this purpose and called Regional Medical Officers. His actual treatment of his patients in a medical respect will never be questioned unless a complaint arises against him. He will be required by the Insurance Committee to notify the times at which his patients may attend his surgery, and satisfy the Committee that such times are reasonable and sufficient to ensure a satisfactory service. The terms of service define the medical treatment required to be given as: "All proper and necessary medical services other than those involving the application of special skill and experience of a degree or kind which general practitioners as a class cannot reasonably be expected to possess."

The insured person, unless too ill, or in an emergency, is required to attend the doctor's surgery for advice and treatment at the stated times, and he is also required to obey the instructions of his doctor as to treatment. But when his condition requires it the doctor must visit and treat a patient at any place where he may be at the time, if that place is within the district in which the doctor has undertaken to visit insured persons.

The doctor is also under *obligation to attend any person who claims to be insured, whether on his list or not*. In the absence of proof of claim to insurance benefit by production of a medical card the doctor is entitled to make a charge, but must do so *on a particular form provided for the purpose*.

Though not entitled to withhold treatment at the time, the doctor may refuse to take a patient on his list by giving proper notice to the Insurance Committee. If, however, all the doctors in any area so refuse, the individual is allocated to a particular doctor by the Committee. Such allocation may be made in practice for one year at least on a system of rotation. The insured person, by giving proper notice, may change his doctor at certain times, or at any time either by consent of both doctors concerned, or if he moves out of the area of practice of the doctor on whose list he is.

Drugs and Appliances.—The insured person is entitled to receive "proper and sufficient medicines" as part of his Medical Benefit. In addition to the ordinary drugs and medicines he may obtain such dressings and appliances as are listed in a special schedule. These are generally prescribed by the doctor and dispensed by the chemist, to whom payment is made under a tariff.

When a rural doctor dispenses for his private patients he may be required to dispense for insured patients for whom access to a chemist is difficult. For the convenience of those doctors who wish to use it, a National Formulary is provided. This is of a comprehensive character, but there is no compulsion to use it.

Prescribing.—The doctor is free to prescribe any drugs, etc., "requisite for the treatment of the patient," but is expected to be reasonably careful to avoid extravagance in this respect. The drug fund for meeting the cost of dispensing is ample but not unlimited, and it is as easy to be extravagant in prescribing as in, for example, eating and drinking. The ordering of expensive

proprietary preparations instead of less costly remedies of reputed analogous effect illustrates this point. Every prescription is eventually examined by a pricing bureau, and by this means the number and average cost of a doctor's prescriptions is known. Should this average cost be markedly in excess of the average in his area, a particular doctor's methods will call for examination.

In the first instance a Regional Medical Officer will call in an informal way to explain the situation or hear any explanation after the doctor has received a statement of the facts which appear to indicate extravagance, and the matter may rest at that. Should, however, a doctor continue to prescribe in a manner deemed extravagant, he may be surcharged. But before any surcharge is made he will be given an opportunity of contesting the complaint of extravagance by justifying his conduct before his peers, namely the Panel Committee of his area.

Some amount of ill-informed comment on the subject of excessive prescribing has from time to time appeared in the public press. Attempts have been made to justify the statement that the panel patient can only expect cheap and inferior medicines, and that the doctor who tries to do his best for his patient is handicapped by fear of the charge of excessive prescribing. Very little experience of the actual facts is necessary to falsify this criticism. Any doctor who prescribes on reasoned lines has nothing to fear in this respect. It should be remembered, however, that most doctors start practice with very little knowledge of the cost of the remedies they prescribe, and the supervision exercised is both necessary and reasonable. Convincing evidence on the latter point is the fact that in 1931, of 14,840 doctors in England and Wales, *four* only were surcharged for excessive prescribing.

Certification.—Under the Act it is the duty of the doctor to give certificates in a prescribed form of incapacity for work by reason of ill health if requested by the patient. These certificates are the evidence on which payment of sickness and disablement benefit are made to the patient. The certificates are given without charge and must be given with proper care, and in accordance with the regulations. The certificate being addressed to the patient and given to him (or her) avoids any possible infringement of professional secrecy. So far as the doctor is concerned, the certificate becomes the property of the patient, who is free to make what use of it he chooses.

Not only is it important that the insured person who is genuinely incapable of work should receive certificates, but it is equally important that they should not be issued unless the practitioner is satisfied that the patient is in fact incapable of work. The certificate is in the nature of a cheque drawn on the funds of the approved societies.

Lax certification is a serious charge which has been made against panel doctors in general by reason of the increased claims for cash benefit in recent years. This charge has been vigorously denied and other reasons for the increased claims put forward. In any case the need for the strictest care in issuing certificates cannot be too strongly emphasized. The certificates, including the first certificate of incapacity, the intermediate ones, and the final certificates, are printed on special forms which state that the patient was examined on the day on which they were given. In certain cases in which such a certificate cannot be truthfully signed, an alternative voluntary form can be used. The novice in insurance practice cannot be too careful in observing the regulations governing the issue of certificates. Inaccurate certification is looked upon as a very serious offence. When in doubt whether he should continue to issue certificates of incapacity, a doctor may submit a reference to the Regional Medical Officer.

Records.—The doctor is required to keep and furnish records, on the official forms, of illnesses, with clinical notes of his patients. These are private documents and are only seen by the medical officers of the Ministry and the doctors in whose charge they rest.

As soon as a patient's medical card has been stamped with his doctor's name, his record card is supplied to his doctor. On this must be recorded in brief any visit or consultation, the nature of the complaint, and the clinical notes. The records are inspected from time to time by the district Regional Medical Officer, who reports to the Ministry. This part of the panel doctor's duties has been much objected to by the profession on the ground that it serves no good purpose, and is a tax on his time when he is most occupied. The fact remains that he has contracted to keep them and is paid for the duty. The necessary entries can be made very briefly, and, if the duty is carried out in a systematic way, need be no great tax on time or patience. Furthermore, the records so kept are a most useful reference, both to the doctor himself and to any other doctor who at a further date may have the care of the patient. Here again, laxity will in the end lead to trouble and should be avoided.

Remuneration.—The method of payment is *per capita* of the insured population. An estimate of the number of insured persons is first made by the Government Actuary. A sum of money arrived at by multiplying this number by the Capitation fee is set aside as the Central Practitioners' Fund. This sum is divided into local area funds on a calculated basis. The capitation fee has been subject to variation, but as the result of a Court of Inquiry in 1924 the sum of nine shillings was decided upon. This amount has been subject to the 10 per cent cut of recent years, and, when economic conditions allow, the restoration of the 10 per cent will take place. There are those in the profession who claim that the figure should be raised on account of the increase in the amount of work done in response to the growing tendency of the insured to seek advice, and for other reasons. Equally there are those outside the profession who consider the remuneration too high, and the cost of the service disproportionate to its utility. The main point from the public point of view is that present conditions attract a good class of practitioner with a resulting good service. The doctor who dispenses for his patient receives in addition a capitation fee of two shillings and three pence. Alternatively he may elect to be paid per prescription under the same tariff as the chemist.

There is also a mileage fund for patients living at a distance from the doctor, the method of allocation of which is decided upon locally. Special remuneration is also provided in rural districts where the conditions of service are unusually difficult.

Disciplinary Action.—The purpose of the Act is to provide a good general practitioner service to the insured, and on the Minister of Health is placed the duty of seeing that this is secured. For this purpose there must be machinery, not only for supervision, but also for investigating any complaints that may arise, and for such disciplinary action as may be necessary.

A general supervision is exercised by medical officers of the Ministry appointed for the purpose. The Regional Medical Officer visits the insurance practitioner, notes the conditions under which he carries on his practice, and inspects record cards. His object is to assist the doctor in every possible way to carry out his terms of service, and he should be looked upon as an adviser rather than an inspector, as a help rather than a critic. Regional Medical Officers also examine patients referred to them for consultation or as to their capacity for work. The disciplinary machinery, at first instituted to deal with infringement of the terms of service, gave rise to much discontent and threatened to interfere with the smooth working of the service. As a result

of this dissatisfaction the present system was devised after long and careful collaboration between representatives of the profession and the Ministry. In every stage of the investigation as detailed hereafter, the medical profession itself takes an important part. Experience has justified the wisdom of the change and the success of the existing method, which works well and has entirely removed the discontent which previously existed.

Should a complaint be made against a doctor, the method of investigation is carefully laid down and must proceed on definite lines which ensure that the accused will receive fair play. The Medical Service Sub-committee of the local Insurance Committee, consisting of an equal number of doctors and lay members, with an independent chairman, must first investigate the complaint. The hearing is private, and legal representation is not permitted on either side. After the hearing a report is presented to the Insurance Committee containing a statement of facts proved, inferences of fact properly deduced therefrom, and a recommendation as to action considered desirable.

The Sub-committee may also draw attention to previous reports and recommend that they be taken into account. The Insurance Committee must accept as conclusive the Sub-committee's findings of fact. Having adopted the report and decided to recommend what action, if any, should be taken, it is forwarded to the Ministry. The accused has the right of appeal against any decision of the Insurance Committee, other than a recommendation that he be removed from the panel. In the latter case a special judicial inquiry *must* be held.

In the absence of appeal, the Minister, before deciding that any sum of money is to be withheld, affords the practitioner an opportunity for making representations in his defence, either orally or in writing, but he may not at that stage raise any question as to the facts established. Again, in cases in which professional negligence is the issue, before the amount to be withheld is decided, the case comes before an Advisory Committee. This consists (in England and Wales) of the Chief Medical Officer of the Ministry or his deputy, two other medical officers of the Ministry, and three Insurance doctors chosen by the Ministry from a panel nominated by the Insurance Acts Committee of the British Medical Association. The decision of the Minister after receiving the report of this Committee is final.

In any system of service where disciplinary machinery is required, a test of the efficiency of the system is the extent to which the machinery is put into use. Judged by this standard the National Health Insurance system comes out well. In 1932 the number of cases in which remuneration was withheld for infringement of the terms of service was 109, and the total amount withheld £1015. These facts, in a service embracing 15,860 doctors in England, Scotland, and Wales, attending 15,000,000 patients at a total remuneration of £6,055,000, speak for themselves.

Organization.—The interests of doctors in insurance practice are carefully watched by the Insurance Acts Committee of the British Medical Association. This Committee is recognized by the Ministry as the negotiating body of the profession. Once a year at least a conference of representatives of all panel committees is held, and to this conference the Insurance Acts Committee reports, as the executive body of the conference.

The Insurance Acts Committee, while keeping a jealous eye on the rights and interests of the doctors, co-operates in every way with the Ministry in efforts to improve the efficiency of the service.

Advisory.—The doctor who is considering the question of engaging in insurance practice can look forward to fair remuneration for his services:

remuneration, moreover, paid quarterly in amounts that can be anticipated, and without any book-keeping. If he gives his patients honest service on the lines of his private patients of the same class, he will be troubled with no more interference than the occasional visit of a Regional Medical Officer. The most likely source of trouble in his administrative duties will be in connection with certification, the keeping of record cards, and the rendering of certain prescribed reports. Simple care and honest work are all that is needed to avoid criticism.

If he is wise, he will recognize from the first that, though the treatment and prevention of disease is a very important duty, it is equally important to fulfil the administrative duties which are part of his contract and for which he is paid. This class of work cannot be done efficiently without system and method. It is well worth while to consider carefully the proper organization of the work. Certificates, prescription forms, record cards, and other documents kept in their proper place, patients examined systematically, adequate surgery and waiting-room accommodation, all mean a saving of time. All doctors know the value of saving time. The saving of a fraction of a minute in seeing twenty or more patients soon runs into a substantial total.

Conclusion.—The Insurance Act has been in operation for more than twenty-one years. It is the first big scheme of preventive medicine applied to general practice. In the opinion of most competent judges its results have exceeded the most optimistic hopes of those who helped to place it on the Statute Book.

The fears of the profession who at first opposed it have been falsified, and it is firmly established in the health machinery of the country. Evidence of its success is claimed in its smooth working, increasing popularity, and the general improvement in the health of the nation. There are not wanting those who take the opposite view. These point to the high cost of the scheme in proportion to its utility, and concentrate on any unfavourable evidence. Whatever view is held, there can be no escape from one important conclusion—any degree of success or the reverse must in the main lie at the door of the profession who engage in the work.

By this criterion will the reputation of the general practitioner be judged, and from this verdict there is no escape. The present writer has no fear of the issue if those responsible for medical education, and the profession as a whole, recognize the full significance of the system and give it the attention and support which it deserves. It is not yet possible to appraise the situation. We are still too near the beginning of this stage in medical history to see things in clear perspective. The inter-relationship of current events must await the verdict of the future.

Meanwhile it is significant that the establishment of the National Health Insurance system coincides with a great advance in the concern of the public in health matters. At the same time the intelligent interest of the individual, both in the prevention and treatment of disease, and a distinct advance in the reputation and importance of the general practitioner, are noteworthy.

Those who maintain that these changes are not only coincident but closely connected may point to the Insurance Act as a great and important common factor. How great and how important time alone will prove. Meanwhile on the profession *as a whole* lies the heavy responsibility of making this great health service an ever-increasing success. The measure of its response to this demand will be the measure of its reputation in the estimation of the public.

NEPHRITIS AND NEPHROSIS. (See RENAL DISEASES.)

NEURALGIA, TRIGEMINAL.*Geoffrey Jefferson, M.S., F.R.C.S.*

W. E. Dandy¹ has become a very strong advocate of the treatment of trigeminal neuralgia by **Division of the Sensory Root in the Posterior Fossa**. He reported his first 88 cases treated thus in 1929, and at the time of this later communication he has operated upon 250 cases. The cerebellar route has, he thinks, many advantages over the classical temporal approach, and he has now had a series of 150 cases without a death. The operation is done by making an opening beneath the tentorium on one side, evacuating the cisterna magna, and gently retracting the cerebellar lobe. Further cerebrospinal fluid having been evacuated, the fifth root comes almost at once into view, and as much as may be necessary is divided. Dandy thinks that merely a partial section is enough to abolish pain, and speaks of cutting one-half and even as little as one-tenth of the root, leaving the patient cured of his neuralgia and with unaltered sensation in the skin of the face. This statement has been greeted with considerable scepticism, and he now states that he has had four recurrences, but only four. He believes that keratitis is less common after section of the root in this situation, but since his divisions are subtotal this may well be the reason rather than the absence of trauma to the nerve-fibres to which he actually attributes it. It is quite true, of course, that trauma to the trigeminal fibres is very slight in this method, as they are cut as soon as seen. The risks of damage to other structures in the posterior fossa are theoretically by no means inconsiderable, and have deterred other surgeons from adopting the cerebellar approach as a routine. Dandy states that a petrosal vein barring the exposure of the nerve by passing between the superior petrosal sinus and the cerebellum is only met with about once in fifteen cases and can easily be dealt with by electrocoagulation.

In the discussion which followed Dandy's paper, C. H. Frazier spoke of his own experience with the temporal route. He had divided the sensory root 720 times and considered that in the hands of the majority of surgeons it was the safer of the two possible approaches. His own mortality was 0.2 per cent. It should be pointed out that Dandy had met with 18 unsuspected tumours in the lateral recess in his series of 250 cases, and this certainly is a strong point in its favour. As for safety, he is himself convinced that it is an entirely safe procedure and he carries it out under local anaesthesia in half an hour, and he has done it in fifteen minutes.

Wilfred Harris² is still of the opinion that **Alcohol Injections** by his own technique or by that of Härtel are much to be preferred to operation. He adduces figures in support of his contention, and states that he can produce localized anaesthesia according to the position of the needle point in the ganglion and the amount of alcohol injected. It is obvious that there can be no certainty about this, but it must be admitted that there are many cases in which it is the correct method, particularly in the aged. Ganglionic alcohol injections are, however, often extremely difficult, and it is only justified in the hands of those as expert as Harris himself, and these are very few.

W. Braeucker,³ of Hamburg, describes his experiences with alcohol injections. He favours infiltration of the ganglion with the needle point in the foramen ovale but not pushed up into the ganglion proper. He thinks it unwise to attempt to destroy the ganglion with alcohol and that it is not necessary to do so to obtain a therapeutic result. There is no doubt that recurrence will be met with fairly frequently after these conservative injections.

K. H. Bauer,⁴ of Göttingen, spoke of 15 cases cured by percutaneous **Electro-coagulation of the Ganglion**, but most surgeons will oppose this on the grounds of danger to surrounding structures.

In the reviewer's opinion it is impossible to generalize on the treatment of

trigeminal neuralgia. Each case must be considered individually, and it should be left to the surgeon to decide which method is the best one for each person. The physician who does injections himself will naturally advise injection for all cases. The surgeon trained in neurological work will have a natural bias for open operation; but he can at least vary his method to suit his patient, and inject some, operate on others. The point that Dandy brings out about unsuspected tumours in the lateral cerebellar recess is an important one in favour of the cerebellar route, if it is supported by a like experience in other clinics. But M. J. Cooper⁵ speaks of Frazier having discovered 3 tumours of the Gasserian ganglion in 300 neuralgia operations, and could find only 4 more altogether out of 5000 cases, mainly neurological necropsies at the Philadelphia General Hospital. This is, assuredly, not quite the same thing, for Dandy is referring to tumours in the lateral recess rather than those of the ganglionic envelopes in the middle fossa, which are distinctly rare. Everyone is agreed on that point.

REFERENCES.—¹*Ann. of Surg.* 1932, Oct. 787; ²*Brit. Med. Jour.* 1932, ii, 87; ³*Zentralb. f. Chir.* 1932, Dec., 2962; ⁴*Ibid.*; ⁵*Amer. Jour. Med. Sci.* 1933, March, 315.

NEURITIS OF THE LATERAL FEMORAL NERVE.

Macdonald Critchley, M.D., F.R.C.P.

The clinical manifestations of anterior crural neuritis have recently been described (MEDICAL ANNUAL, 1932, p. 320); neuritis of the lateral cutaneous branch alone is by no means uncommon, and constitutes an interesting clinical picture. O. Sittig¹ has recently dealt with this particular affection, basing his remarks upon 49 cases observed over the period 1922-33. Neuritis of the lateral cutaneous nerve of the thigh is often spoken of as '*meralgia paræsthetica*', though in Germany it is also termed '*Bernhardt's disease*'. The chief symptom consists in paræsthesiæ or pains in the territory of the lateral femoral nerve, viz., on the outer side of the leg, beginning just below the iliac crest and extending downwards to a point above the knee. In breadth it extends from the mid-line of the thigh anteriorly, outwards over the lateral aspect, and on to the posterior surface for a short distance. The paræsthesiæ comprise feelings of pins-and-needles, tingling, twitching, or pricking. Sometimes pain does not appear until the patient has been standing or walking for a while. Pain and paræsthesiæ may occur in combination or separately. On examination one usually finds some reduction in sensibility over the outer side of the thigh (Fig. 74). Painful pressure-points may be demonstrable, and L. Preti² found in his case a palpable cord-like infiltration of the nerve with nodules.

The disease is commoner in men than in women. Sittig found the right side affected in 27 cases, the left side in 14, while in 8 cases the affection was bilateral.

ETIOLOGY.—From the literature it would seem that alcoholism, trauma, pregnancy, spondylitis, infections, rheumatism, phlebitis, myositis, and pes valgus may all be of etiological significance. Sittig, from his own experience, draws attention to the etiological significance of abdominal operations. In an article published in 1928,³ he had described 12 cases of neuritis of the lateral femoral nerve, among them 5 after appendicectomy. Since then he has

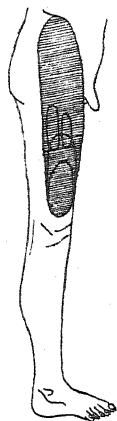


Fig. 74.—Showing area of reduced sensibility in neuritis of the lateral femoral nerve. (By kind permission of 'Medical Press and Circular'.)

seen 3 others; in all these 8 cases the affection was on the right side. The patients said that they had noticed immediately after operation, or on the second day, a dead feeling in the outer side of the right thigh. Besides the 8 cases of neuritis after appendicectomy, Sittig had observed the neuritis after operations in 7 other cases (fibroids, 1; extirpation of kidney, 2; herniotomy, 1; abdominal tumour, 1; tubal pregnancy, 1; cholecystectomy, 1). A previous rheumatic disposition appears to be important in the etiology.

TREATMENT.—As a rule no treatment is called for. Sittig recommends **Inunctions, Analgesics, Electrotherapy, Diathermy, and Pyretotherapy.** One case responded well to **Novocain** infiltrations. Other authors have recommended perineural infiltration with an isotonic solution of **Antipyrin** with **Isoalkalin**. In some severe or obstinate cases, resection of the nerve has been recommended.

REFERENCES.—¹*Med. Press and Circ.* 1933, July 26, xiii; ²*Riforma med.* 1912, iv, 85; ³*Med. Klin.* 1928, No. 6.

NEWBORN, DISEASES OF.

Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.

Asphyxia Neonatorum.—In a report on 66 cases of asphyxia neonatorum investigated in relation to its causes, and treatment by prolonged artificial respiration, D. P. Murphy and J. V. Sessums¹ observe that *maternal narcosis, forceps operation, and breech delivery* were responsible for 42, or 63·6 per cent, of the respiratory difficulty: 30 of the infants recovered, and of the 86 which did not survive, *cerebral injury* was subsequently proved in the case of 19. There were only 9 spontaneous vertex deliveries in the entire series, 86·5 per cent of the total requiring some form of operative interference. It is important to note that the mortality of the infants delivered by the breech was twice that of those delivered by forceps. Another interesting part of the report deals with the importance of *maternal narcosis* as a factor in the causation of asphyxia in the newborn. Although it did not account for any actual mortality, the authors regard narcosis as the most common single cause of respiratory difficulty. No other cause could be determined other than the use of *morphine sulphate* (gr. $\frac{1}{4}$ to $\frac{1}{2}$ to $\frac{3}{4}$), *scopolamine* (gr. $\frac{1}{600}$ to $\frac{1}{100}$), *sodium amytal* (gr. $\frac{1}{8}$), or *magnesium sulphate* (50 per cent 2 c.c.) in the case of 16 infants asphyxiated at birth. Murphy and Sessums, in view of these findings, advise that the use of narcotics, such as those mentioned, be reserved for the earlier part of labour and *not given later, especially if operative delivery is to be employed*. Otherwise, the influence of the narcotic upon the baby may be just sufficient to throw the balance on the wrong side, even though every effort is made to save the child's life.

Prolonged artificial respiration by means of the '**Drinker**' Respirator apparatus advocated by D. P. Murphy² is considered to be distinctly beneficial and in all probability life-saving. The respirator has no injurious effect upon the infant and is gentle in its action. The apparatus is shown in *Plate XXXVIII*. The infant is placed in an air-tight container with its head protruding from the end of the apparatus through a well-fitting rubber collar. The head is thus exposed to the room-air. By means of an electrically driven air-pump and valves, changes of negative air-pressure are induced, and these are made to alternate rhythmically with the atmospheric pressure. When negative pressure is applied, air at atmospheric pressure enters the lungs, and the chest expands. When the former returns to normal, the elastic recoil of the chest produces expiration.

The results of treatment in the case of the 66 infants are reported as follows: 15 children failed to breathe at any time, though the hearts of three were

known to be beating after birth; 5 breathed before but not after treatment had been commenced; of the remaining 46, in whom breathing was established, 39 finally developed an adequate degree of respiratory activity, but of these 9 subsequently died in hospital, leaving a net survival rate of about 45 per cent.

Hæmorrhages in the Newborn.—Statistical investigation shows that for every 1000 babies born alive, about 30 die during the first ten days of their existence. The chief cause of these neonatal deaths is *intracranial* hæmorrhage. Thus B. Fischer³ found hæmorrhage visible to the naked eye in 65 per cent of 500 brains which he examined. Similar figures are published by J. N. Cruickshank⁴ and F. C. Irving,⁵ but it must not be thought that bleeding in the newborn is confined to the cranial cavity. Extravasations of blood of varying size were found by A. Copper⁶ in relation with the lungs, gastro-intestinal tract, spleen, liver, and skin in over one-half of 150 neonatal deaths which he investigated by autopsy. The prevention of such bleeding has recently been studied by R. J. Heffernan.⁷ Neonatal hæmorrhages, this author states, are broadly divisible into two groups, traumatic and spontaneous. The former can only be prevented by better obstetrics, and the application of the dictum '*Non vi, sed arte*' (De Lee⁸). Delivery through an incompletely dilated cervix, difficult high forceps operations, faulty application of forceps, improper traction and *pressure* in breech extraction, the injudicious use of pituitary extract, not uncommonly cause tears of the falx cerebri or tentorium cerebelli with rupture of blood-vessels and hæmorrhage. Heffernan⁷ thinks that the incidence of intracranial bleeding of some degree, not necessarily fatal, in all newborn babies may be conservatively estimated at 20 per cent. This high figure is reached by the inclusion of the comparatively large number of children who develop hæmorrhages, intracranial and otherwise, following an easy forceps operation or a normal spontaneous delivery.

New light has been thrown upon this interesting group by the work of F. C. Rodda⁹ on the coagulation of the blood of infants. Rodda found that the average coagulation time in normal infants is seven minutes and the average bleeding time three and a half minutes. Prolongation of coagulation and bleeding times from the first day, and increasing from the second to a maximum on the fifth day, was observed in the majority of cases. Evidence of hæmorrhage usually occurred when a prolonged bleeding time accompanied a prolonged coagulation time. W. P. Lucas¹⁰ has demonstrated that this defect is the result of a diminution in the prothrombin element during the first few days of life.

Working on this basis, Heffernan⁷ during the past four years has adopted the routine prophylactic **Injection of Whole Blood**, and claims it to be a harmless procedure and of definite value in reducing the incidence of *all* hæmorrhages of the newborn: 20 c.c. of the mother's blood taken from a basilic vein are injected into the loose tissues under the baby's scapula, 10 c.c. on each side. In 800 hospital and private patients, including 562 forceps operations (!) (385 low, 151 mid, and 26 high) and 91 breech deliveries, the gross fetal and neonatal mortality was 2.5 per cent. Excluding 7 deaths due to prematurity in children born before the seventh month, the corrected neonatal mortality is 1 per cent.

The author defends the large proportion of forceps deliveries in his series with the observation that "a low forceps and episiotomy, in trained hands, lessen the strain of delivery to mother and baby", an opinion by no means universally shared!

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1932, Oct., 432; ²*Jour. Amer. Med. Assoc.* 1930, xcv, 335; *Amer. Jour. Obst. and Gynecol.* 1931, xxi, 528; ³*Schweiz. med. Woch.* 1924, v, 905; ⁴*Lancet*, 1923, i, 836; ⁵*New Eng. Jour. Med.* 1930, Sept. 11, 499; ⁶*Amer. Jour. Dis. Child.* 1928, Feb., 262, March, 443; ⁷*Ibid.* 1932, Aug. 18, 293; ⁸*Obst. and Gynecol.* (Practical Medicine Series), 1924; ⁹*Amer. Jour. Dis. Child.* 1920, xix, 269; ¹⁰*Ibid.* 1921, xxii, 525.

NOISE.*F. W. Watkyn-Thomas, F.R.C.S.*

During the past few years public attention has been increasingly drawn to the irritations of noise. More than ten years ago E. Escat¹ remarked that "there is no organ in which public and professional hygiene takes less interest than the organ of hearing, and one would say that our engineers had pledged themselves to overwhelm the ears not of factory workers only but of all town-dwellers, by the most harmful and injurious acoustic stimuli; for my own part I know of several cases of labyrinthine deafness brought on by the use of a tedious 'Klaxon'. Here there is a real danger to the public of which the Academy of Medicine should feel it their duty to warn the competent authorities."

On the other hand, in a recent publication of the "Industrial Research Board", F. C. Bartlett and K. G. Pollock² remark that "the alleged physiological and psychological effects of noise have frequently been made a subject of drastic comment in more or less popular writing". They find that "noise may under certain conditions exercise a disturbing effect on human efficiency, though probably to a less degree than is commonly supposed to be the case", and further qualify this remark—"when all kinds of popular statements about the baneful effects of noise are prevalent, it becomes very easy for any person who is 'off colour', or who fails to adapt himself to his social group, to make noise the butt of his grievances". If such an opinion could be accepted it would abolish our problem. Unfortunately Dan McKenzie^{3,4} so thoroughly demonstrated the inadequacy of their experimental methods and the fallacy of their conclusions that the work cannot be regarded as of much help.

For many years it has been known that subjecting the ear to continuous stimulation by certain notes causes degeneration of well-defined areas of the organ of Corti. The best-known experiments are those of Wittmaack, Yoshii, and Siebenmann (principally on guinea-pigs and rabbits), and the position of the degenerations (roughly speaking the higher the note the nearer the area of degeneration is to the base of the cochlea) was so constant that it has been brought forward in favour of the 'resonance' theory of hearing. Beck and Holtzmann found that animals subjected to noise experiments lost appetite and weight, but quickly recovered when the noises ceased.

Turning to human patients, Habermann examined post mortem the cochleas of several patients who had suffered from 'occupation deafness' during life, and found not only a degeneration of the sensory cells of Corti's organ, but also an ascending degeneration of the auditory nerve. The classic work of Ritchie Rodger in this country (published in 1915 and 1923) is on *boiler-makers' deafness*. Rodger found that loss of hearing to the tuning-forks corresponds roughly with the tones of the general causal sound. It is only after men have been many years at the work that the high and low limits are affected. Since then much work has been done. *Weavers' deafness* has been investigated by Solger, who found a steadily increasing loss of bone conduction, and in this country by McKelvie⁵, who found that of 1011 weavers examined, 24.3 per cent had some form of deafness and 6.7 per cent had nerve deafness. This group of nerve deafness cases is the important one from our point of view. No cases were found in subjects employed for less than ten years, and the rise began after twenty years. E. Katzhmann⁶ deals with *miners' deafness*. When the work was done with crowbars and hammers there was a recognized 'miners' deafness', but this was rare, and was found principally among men working above ground with the 'separator', which made a terrific clatter. Since the introduction of motor machinery there had been an increasing deafness among the underground workers. The deafness is a nerve deafness, with loss of high tones, diminished hearing for tuning-forks, and loss of bone conduction. There is also severe tinnitus, but no vertigo. Katzhmann believes

that this deafness is due more to the cumulative effect of the constant vibration of the compressed-air drills than to the noise, although noise plays a part. This suggestion is very important. We have always believed that only the middle and upper tones could produce an 'occupation deafness', and v. Eicken's experiments prove that low tones cannot cause deafness by air conduction. If Katzechmann's view is right, low tones, with their deep and ample vibrations, should be able to cause deafness by bone conduction.

K. Wittmaack^{7, 8} believes that he has produced degeneration of Corti's organ by low notes conveyed by bone conduction. Guinea-pigs were kept on metal sheets which were struck at constant intervals with a hammer. The note produced was about fifty-seven double vibrations per second. These results are not yet fully proved, but they certainly support the opinion of Katzechmann.

The possibility of vibration causing deafness by bone conduction adds enormously to the difficulties of preventing noise deafness. It is possible to cut off the middle tone noises by carefully packing the external meatus with wax. Unfortunately this will not protect the cochlea against the highest notes or noises of great intensity, and no kind of ear protection is of any practical use against sounds carried by bone conduction. It has been shown by N. Losanov⁹ that any nasal obstruction or accessory sinus disease increases the liability to noise deafness, and here the sufferers can be helped to some extent, but it seems clear that the only real remedy for an increasing danger must be by legislation. The most damaging street noises, for example, are those of high pitch such as some kinds of motor horn, or clattering machinery producing overtones, or those of great intensity such as street drills or 'back-firing' cars. For office workers and town-dwellers generally some most useful work has already been done by Bagenal and Barnett¹⁰ in a paper on the reduction of noise in buildings. It is to be hoped that such work will be continued in the interests of the community as a whole.

NOTE.—In discussions on noise the term *decibel units* is frequently used. One decibel is taken as the least intensity of sound at which any given note can be heard, and a scale is constructed of so many decibels to describe the intensity above this threshold value for any sound of the same pitch. It is a convenient method but very rough and ready, and must not be taken as scientifically accurate. Strictly speaking the decibel scale is a useful way of comparing different intensities, and nothing else.

REFERENCES.—¹*Monographies oto-rhino-laryngologiques internationales*, 1922, No. 6; ²*Two Studies on the Psychological Effects of Noise*; ³*Jour. of Laryngol.* 1933, xlviii, 110; ⁴*Ibid.* 452; ⁵*Ibid.* 603; ⁶*Zeits. f. Laryngol.* 1931, xx, 353; ⁷*Arch. f. Ohren-, Nasen u. Kehlkopf.* 1931, cxxx, 143; ⁸*Ibid.* 1932, cxxxiii, 181; ⁹*Acta Oto-laryngol.* 1931, xiv 34; ¹⁰*Dept. of Scientific and Industrial Research, Building Research, 1933, Bulletin 14.*

OBESITY.

W. Langdon Brown, M.D., F.R.C.P.

Llewellys Barker¹ classifies the causes of obesity thus:—

I. *Obesities of Endocrine Origin*:—

1. Dystrophia adiposogenitalis—the well-known Fröhlich's syndrome.
2. Hypothyroid obesity.
3. Hyperinsular obesity.
4. Hypogonadal obesity.
5. Hyper-interrenal obesity.
6. Adiposis dolorosa (Dercum's disease).

II. *Obesities of Neural Origin*:—

1. Hypothalamic lesions.
2. Lipodystrophia, in which fat is confined to the upper half of the body and markedly absent from the lower half.
3. Unilateral obesity.

It is clear that some of these may overlap. Thus in the obesity of hypopituitarism it is probable that the hypothalamus is also sometimes involved, while in Dercum's disease the pituitary appears to be the endocrine gland primarily at fault, and the emotional and organic nervous signs which often accompany it suggest involvement of the cerebral structures lying over it. Anything which disturbs the relationship between the post-pituitary and the hypothalamus may lead to marked obesity.

It is going too far to maintain, as some do, that all cases of obesity can be cured by diet alone, since the word 'cure' implies that the patient is left in normal health, whereas starvation of a patient with some forms of endocrine obesity leaves him weak but still possessing much watery fat. In these circumstances, J. M. Jones's statement that "every form of obesity represents, in the last analysis, an increase of caloric intake over caloric output" assumes an academic rather than a practical importance.

Diet.—To revert to Barker's paper, he advocates the following principles in the dietetic régime of obesity: it should ensure a negative energy balance, but include enough protein (especially animal protein) to avoid nitrogenous loss and to contain all necessary varieties of amino-acids; there should be enough bulk in the diet to aid in satiety and to avoid constipation; there should be an ample supply of vitamins, and the water and salt intake must be regulated (a point which is often overlooked), and the personal preferences with regard to diet should be considered as far as possible. Naturally the patient's full co-operation is essential.

The following diet has been found successful by Ethel Browning² for obesity in women. It contains only 900 calories, and therefore definitely involves undernourishment.

Breakfast: Tea or coffee with milk, but no sugar; starch-reduced bread (one roll = seventy calories); one pat of butter; grape fruit, orange, or apple.

11 a.m.: Cup of marmite, or clear soup, or beef essence.

Lunch: One egg, or piece of cheese, or steamed fish; one roll with one pat of butter, and green salad with tomato and dressing of olive oil and vinegar, or green vegetables; any raw fruit, or stewed fruit without much sugar.

Tea: Tea with milk, but no sugar; dry toast or biscuits, one pat of butter.

Dinner: Clear soup; lamb cutlet or lean steak or veal (3 oz.), grilled, or white fish steamed or grilled, or chicken; green vegetables (two if liked); no potatoes; fresh fruit salad, baked apple, etc.; small piece of cheese, one roll or dry biscuits.

At bedtime: Glass of hot water with juice of one lemon.

REFERENCES.—¹*Calif. and Western Med.* 1932, Aug., 73; ²*Med. Press and Circ.* 1932, Nov. 23, 427.

OCCUPATIONAL DISEASES. (See DERMATITIS VENENATA; TOXICOLOGY.)

OMENTAL TORSION.

A. Rendle Short, M.D., F.R.C.S.

Some interest has been aroused in this condition, which was discussed in the MEDICAL ANNUAL for 1932 (p. 330). The reviewer has since had 2 cases in his own practice. R. H. Wallace and R. H. Miller¹ relate 8 examples, which showed pain, tenderness, and usually a palpable lump. All did well. C. E. Farr and R. F. Bachmann² add 7 more.

REFERENCES.—¹*New Eng. Jour. Med.* 1933, April, 831; ²*Ann. of Surg.* 1933, May, 766.

OPHTHALMIA NEONATORUM. (See CONJUNCTIVA, DISEASES OF.)

OPTIC NERVE, DISEASES OF. *Sir Stewart Duke-Elder, M.D., F.R.C.S.*

Retrolbulbar Neuritis.—An interesting paper by W. L. Benedict¹ on retrolbulbar neuritis is of importance in showing the small part played by sinus disease in the causation of this condition, and the great importance of disseminated sclerosis. Benedict points out that the term 'retrolbulbar neuritis' may lead to confusion in trying to visualize the lesion. It implies that its situation is between the globe and the chiasma, when, as a matter of fact, the lesion often lies in the chiasma, or posterior to it in the optic tracts or radiations. This fact does not prevent operations upon the nasal sinuses being carried out. Changes in the visual fields are not often found even in rather extensive diseases of the sinuses; nevertheless, in cases of retrolbulbar neuritis, rhinologists are often urged to operate upon ethmoid and sphenoid sinuses in which they can find no disease. Any connection between sinus disease and retrolbulbar neuritis becomes much less credible when one considers the vast numbers of cases of severe suppurative sinus disease without visual symptoms. The transmission of inflammation from the sinuses to the optic nerve, either by direct extension, through the blood- or lymph-stream, or by toxins emanating from thickened mucous membranes, has received no convincing experimental corroboration.

ETIOLOGY.—The etiology of 225 cases of retrolbulbar neuritis at the Mayo Clinic was determined as follows:—

Multiple sclerosis	155
Pernicious anæmia	14
Diabetes	14
Alcohol and tobacco	28
Syphilis	2
Congenital amblyopia	4
Familial causes	1
Sinus disease	1
Post-partum hæmorrhage	1
Plumbism	2
Indeterminate causes	3

225

Of more than 500 definitely proved cases of multiple sclerosis observed at the clinic, disturbance of vision was given as the first symptom in about 15 per cent. In an additional 35 per cent to 40 per cent, disturbance of vision was an early development. In all cases retrolbulbar neuritis was the symptom most commonly observed. In more than 60 per cent of these cases, intranasal sinus operations had been performed elsewhere because of visual disturbance.

TREATMENT.—The most successful form of treatment has been found to be **Protein shock** by intravenous injection of triple **Typhoid Vaccine** in increasing doses of from 25 up to 450 million bacteria, the injections being given three or four times weekly until vision has returned. If vision does not return within two weeks, the protein treatment is discontinued. At the clinic **Iodides** are prescribed to be taken for thirty days after vaccines have been stopped. In comparing the treatment by means of foreign protein with the effect of operation on the sinuses, it is evident that the improvement obtained is due to the same factor. It has been shown that the injection of typhoid vaccine materially increases the peripheral circulation, and it is probable that the resultant improvement in the circulation of the nerve restores its function. The same effect can be produced by any agent which will induce the same circulatory effect. Administration of **Nitrates**, **Pilocarpine**, and other drugs with a like action, has similar effects upon vision.

Operation upon sinuses has two effects which have not been fully taken into account by those who advocate them for retrolbulbar neuritis. Packing

the nose with **Cocaine and Epinephrine** for anæsthetic purposes produces, first, ischæmia, and then congestion of the membranes. Following the operation, the congestion of the mucous membrane continues until healing is complete. If the operation has been sufficiently extensive, there is commonly a rise of temperature from absorption of blood, which, in effect, is autovaccination. These two factors are similar to the effects produced by the injection of foreign proteins, and the results are parallel. Operations upon the sinuses are followed by quick (visual) improvement, but often relapses occur shortly after operation because hyperæmia has not continued long enough. By packing the nose once or twice daily with epinephrine and cocaine, and allowing the packs to remain in place for three hours, hyperæmia can be induced for a longer time and is reported to be as effective as are operations upon the sinuses in retrobulbar neuritis. A very similar conclusion—that a nasal cause of this disease is unusual, and nasal operation as a method of cure unjustifiable—is reached by von Hippel² in a similarly exhaustive paper.

Tuberculosis of Optic Nerve Causing Meningitis.—G. von Szabo³ reports an interesting case of primary tuberculous infection of the optic nerve giving rise to tuberculous basilar meningitis. A girl aged 6 years had noticed failing vision in the left eye, without pain or inflammation, for four weeks prior to her admission to the hospital. A diagnosis of basilar meningitis of a tuberculous nature was made, and œdema of the left disc with retinal hæmorrhages and yellowish-grey discolorations of the retina were observed. The patient died eight days later, presenting meningeal symptoms. Histological examination of the globe showed the retina to be thickened by œdema to twice its size, the disc was prominent, œdematous, larger hæmorrhages were seen in the deeper fibres, and migrating cells were present in the intravaginal spaces. Four millimetres behind the lamina cribrosa the central vessels were surrounded for a distance of 7 mm. by tuberculous granulations, containing epithelioid, round, and giant cells. Here the nerve-fibres were completely destroyed. The focus in the optic nerve was the primary lesion, as the meningeal symptoms developed over three weeks after the beginning of the failure of vision. Similar cases of an ascending meningitis, arising from the eye, are quoted.

REFERENCES.—¹*Proc. Meetings Mayo Clinic*, 1933, March, 8; ²*Arch. f. Ophthalmol.*, 1932, cxxviii, 23; ³*Klin. Monats. f. Augenheilk.*, 1931, lxxvii, 805.

ORCHITIS. (See TESTIS, ETC., SURGERY OF.)

ORIENTAL SORE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

In a paper on *tropical ulcer as a deficiency disease* L. J. A. Loewenthal¹ refers to an observation of McCulloch to the effect that the blood-calcium is low in these cases and that the affection occurs almost exclusively in the poorest classes living on a deficient diet, while in Uganda the disease is never met with in chiefs and their families, and rarely among the Baganda people, who are well-to-do and include meat and milk in their diet. The Uganda soil is known to be deficient in calcium, and the lesions are those of tissue necrosis rather than of inflammation. These facts led the writer to treat cases of tropical ulcer with intravenous injections of 15 gr. of **Calcium Chloride** in 10 c.c. of distilled water daily in adults and 5- to 7-gr. doses in children. The first result was the disappearance of all offensive odour in three to four days; separation of the sloughs with the appearance of healthy granulations occurred within a week, and cleaning up of the ulcer within ten days without exception, followed nearly always by rapid healing from the edge provided the patients remained at rest in bed. In 69 cases 52 per cent were cured or almost cured and 32 per cent more improved up to the time they

remained in hospital. Further trials of this promising plan will be awaited with interest.

C. Jamas² reports successful treatment of this affection by **Excision** of the ulcers followed by immediate **Skin-grafting**, which gave the best results, with complete success in 41 out of 45 cases, and excision with delayed grafting, with success in 4 out of 5 cases. The average time for complete healing was thirteen days by the first and seventeen days by the second method, while in the case of a small ulcer twenty-one days was required under medical treatment with hot permanganate of potash soaks followed by glycerin and hydrogen peroxide lotion and finally eusol. J. Zwolakowski³ also deals with the treatment of tropical phagedenic ulcer by a number of applications, and he prefers cleaning the ulcers with oxygenated water on tampons and then covering the surface of the ulcer with a layer of **Bismuth Subnitrate** to a thickness of 1 to 3 mm.

REFERENCES.—¹*Lancet*, 1932, ii, 889; ²*Ibid.* 1095; ³*Presse méd.* 1933, March 22, 460.

OSTEITIS DEFORMANS.

E. W. Hey Groves, M.S., F.R.C.S.

In marked contrast to the closely allied condition osteitis fibrosa, osteitis deformans has so far refused to yield up the secret of its nature. In fact it may now be said that the normal calcium content of the blood and urine in Paget's disease may be taken as the most definite distinction between it and osteitis fibrosa. No endocrine gland can be held to be responsible for its cause, though attempts have been made to implicate the pineal body.

T. J. O'Reilly and J. Race¹ have made a careful examination and report of 31 consecutive cases of osteitis deformans which have come under their care at Buxton. From this report certain facts of importance, especially in regard to diagnosis from other conditions, emerge. In 40 per cent both signs and symptoms were present which made the diagnosis obvious. In 33 per cent there were no signs of deformities, but only the vague symptoms of 'rheumatic pain'. In 27 per cent there were neither signs nor symptoms, and the discovery of the condition only resulted from routine X-ray examination. The incidence of the disease in various bones in this group of cases is remarkable. The pelvis and lumbar spine were affected with much greater frequency than any other bones (26 and 24 respectively out of 31 cases). The importance of this lies in the fact that this disease may be the cause of the rheumatic pain for which the patient seeks relief. Unfortunately no treatment has yet been found which has any effect in modifying the course or relieving the pain of the disease. Probably **Ultra-violet Light** or deep **X Rays** will always be worthy of trial, but they give no certainty of relief.

REFERENCE.—¹*Quart. Jour. Med.* 1932, Oct., 471.

OSTEO-ARTHRITIS. (See RHEUMATIC DISORDERS, CHRONIC.)

OSTEOMYELITIS. (See also BONES AND JOINTS—TREATMENT OF INFECTIVE CONDITIONS; NASAL SINUSES, DISEASES OF.)

OSTEOMYELITIS IN CHILDREN. *John Fraser, Ch.M., F.R.C.S.Ed.*

G. Paschlau¹ believes that the osteomyelitis of early childhood, and particularly that occurring in the first year of life, has characteristics which distinguish it from a similar condition in later years. On a pathological basis the early or infantile type has the peculiarity that the lesion is localized on both sides of the epiphysal line—that it is, in other words, an epiphysal as well as a metaphysal lesion. This statement is open to criticism, because in the first year of life many of the epiphyses are either cartilaginous or possess a small

ossific central nucleus, conditions which are not generally recognized as favourable to the development of infections. In so far as the clinical aspects are concerned, the author considers that the osteomyelitis of early childhood is generally less severe and of shorter duration than are the forms which develop later. With regard to treatment, it is stated that in small children with uncomplicated osteomyelitis of the tubular bones incision of the subperiosteal abscesses and of the soft parts is generally sufficient. When the joints become infected, punctures and small incisions without insertion of drains give the best results. Careful nursing and nutrition are of the utmost importance, and if anaemia develops, the injection of human blood may prove helpful.

Cecil Wakeley² states that acute osteomyelitis is a disappearing disease, and he bases this conclusion upon the evidence afforded by the statistics of hospital records in the decades 1900-10 and 1920-30. He explains the lessened incidence by improvement in the general health conditions and in the housing and sanitary arrangements of the people, and he does not consider that injury plays any real part in the development of the disease. In discussing treatment, he recommends immediate operation in every case. If the infection is a spreading one, he advises opening up the diaphysis to the extent of one-third of the circumference; he does not approve of the operation of multiple puncture associated with Starr's name. No mention is made of serum treatment.

REFERENCES.—¹*Monats. f. Kinderheilk.* 1933, Jan. 13, 280; ²*Med. Press and Circ.* 1932, Aug. 3, 87.

OSTEOPOROSIS, TRAUMATIC. E. W. Hey Groves, M.S., F.R.C.S.

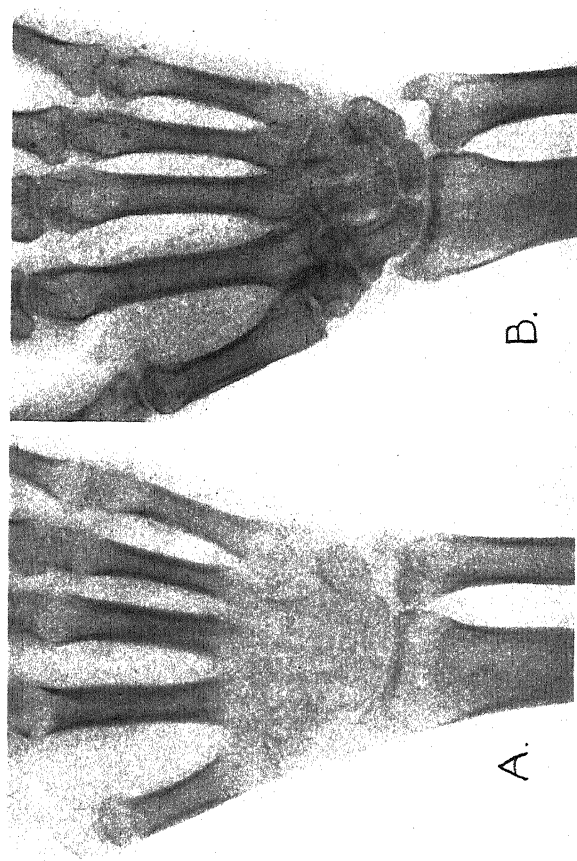
The phenomenon of decalcification of the bones associated with disease, infection, injury, and disuse has become very familiar to us by the revelation of the X rays; but its exact significance is still very difficult to interpret. It almost certainly implies that hyperemia of the bones has been present for some time, but it probably is the outcome of more than one factor. Biochemical, vascular, and nervous changes all play their part. From a practical point of view, however, it is of the utmost importance to be able to recognize what morbid condition is indicated by any given case of osteoporosis, and further what are the treatment and prognosis. The most remarkable work in this connection has been carried out during the past years by Leriche and his school, and, although we may not be convinced of the soundness of his theories, we are bound to admit the great significance of the facts he adduces in their support. R. Fontaine and L. G. Herrmann¹ have recently given a full account of the cases of post-traumatic painful osteoporosis which have occurred in Leriche's clinic. They hold that the osteoporosis is the result of hyperamia which is caused by the reflexes set up by the trauma. It occurs most frequently in the small bones in the neighbourhood of the wrist and ankle. The condition is characterized by four features: (1) Great muscular weakness; (2) X-ray changes which first show a mottled and later a structureless appearance of the bones, indicating a disappearance of the trabeculae; (3) Vasomotor changes, oedema, cyanosis, glossy skin, etc.; (4) Great pain.

A most striking difference between this traumatic osteoporosis and other conditions, e.g., tubercle or osteo-arthritis, which produce similar bone atrophy, is that the former is in no degree improved by rest. In its most typical form it comes on after an injury of the wrist or ankle, which may be merely a wrench of the soft parts, an ordinary sprain, or a frank fracture. It in no way improves by immobilization and it is made worse by forcible movement. Guarded voluntary movement should always be encouraged. Left alone, it tends to improve very slowly, and may remain as a cause of complete

PLATE XXXIX

TRAUMATIC OSTEOPOROSIS

(R. FONTAINE AND L. G. HERRMANN)



Skidograms showing the effect of peri-articular sympathectomy upon post-traumatic osteoporosis which had already reached the height of the disease. Revalidation has taken place very slowly. A, Three months after simple tenotomy of the right wrist; B, Two years after peri-articular sympathectomy.

By kind permission of "Lunds of Surgery"

disablement for many years. After some time it leads to a fusion of the small bones of the hand or foot.

Certainly the X-ray evidence is so striking that it is no wonder that such cases are usually diagnosed in the first place as tuberculosis. The failure to respond to rest should always raise a doubt, and point to the true significance.

According to the Leriche school, **Sympathectomy** is the only treatment which avails anything. They quote no fewer than 22 cases in proof of their contention. Where possible a cervical or lumbar sympathectomy ought to be done. But a perivascular sympathectomy of the brachial or femoral region is always worth while both as an indication of the correct line of treatment and as a means of relieving pain for a time. (*Plate XXXIX.*)

REFERENCE.—¹*Ann. of Surg.* 1933, Jan., 26.

OVARIAN HORMONES. (*See SEX HORMONES.*)

PANCREAS, SURGICAL AFFECTIONS OF.

A. Rendle Short, M.D., F.R.C.S.

Rupture of the Pancreas.—C. S. Venable,¹ of Texas, describes five cases and gives an excellent review of the condition. The special danger after an injury of the pancreas is the liberation of an active juice containing trypsin and steapsin, which may erode the abdominal tissues. At the time of the accident the symptoms are collapse and pain, which may be of extreme severity, with pallor, blueness about the lips, cold sweat, and quick pulse. The upper abdomen is rigid and there is usually vomiting. By and by, unless there is internal hæmorrhage, the pain and collapse improve and the abdomen softens, until another train of symptoms appears. There is persistent pain, maybe intermittent, maybe constant, in the epigastrium and back; this may suddenly stop when the peritoneal covering of the pancreas bursts and liberates the fluid into the lesser sac. The patient, if ambulatory, walks with a stoop, with his hand over the upper abdomen. There may be incessant nausea or vomiting from pressure on the pylorus and stomach. A tumour mass develops in the upper abdomen just to the left of the middle line, over which the stomach is flattened out. This is due to a pseudo-cyst; it may take days, weeks, months, or even years to appear. In cases of complete rupture there is no period of well-being and the tumour comes up in a few days. In cases of incomplete rupture there are three stages: initial pain and collapse; well-being; tumour formation with vomiting and pain. In other cases, however, the picture is complicated by a severe intra-abdominal hæmorrhage.

TREATMENT.—The treatment should be operation during the period of well-being, to avert the present high mortality. The tumour mass is approached through the mesocolon, the abdominal cavity packed off, the fluid aspirated, the rent in the pancreas sutured with linen thread (catgut dissolves too soon), and a drainage tube inserted through the gastrocolic omentum. An **Anti-diabetic Diet** should be given; "by a rigid antidiabetic diet the secretion may be made almost trypsinogen- and steapsin-free, while with the addition of proteins and fats they will reappear". [The author apparently means a purely carbohydrate diet.—A. R. S.] The best protective for the skin against pancreatic digestion is **Xeroform**. Of the 5 cases related, 4 recovered after operation.

Acute Pancreatitis.—C. A. Wells,² of Liverpool, found tenderness in the left costovertebral angle present in 4 cases out of 5; it is not a text-book sign, but appears to be useful.

J. Jacobovici,³ of Cluj in Roumania, describes 14 cases treated by immediate operation, with 6 deaths. He considers drainage of the gall-bladder essential.

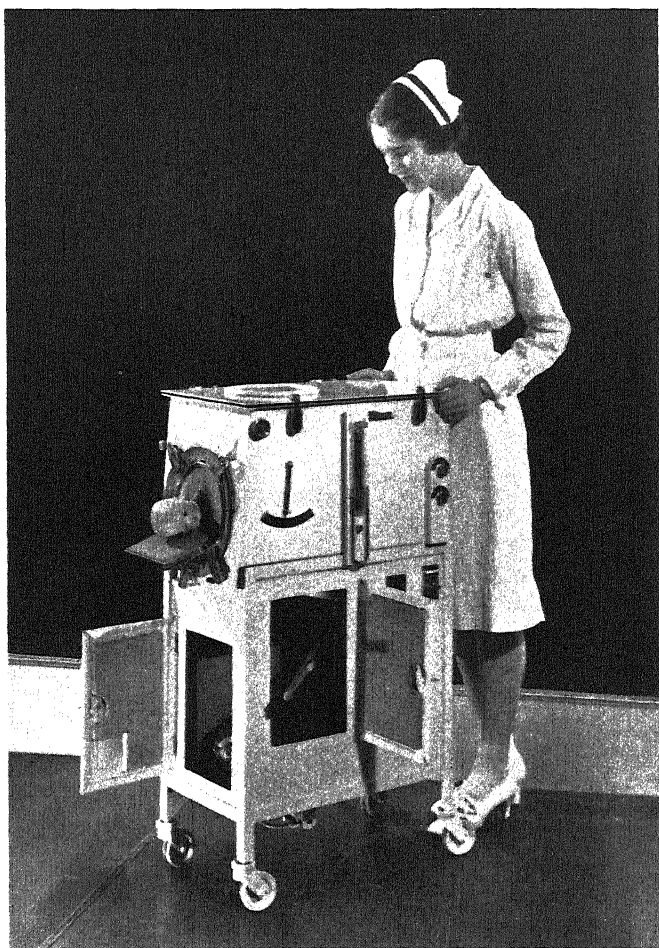
Readers of recent numbers of the *MEDICAL ANNUAL* will recollect that some Danish and German surgeons believe better results can be obtained by medical means in acute pancreatitis than by surgery. J. Hörmann,⁴ of Limburg, contributes an article entitled, "Ought one still to-day to operate for acute inflammation of the pancreas?" He answers in the negative, if the diagnosis is proved, as by a diastase-estimation in the urine. Better results can be obtained by injecting intramuscularly 10 to 15 c.c. of the patient's own freshly **Defibrinated Blood** twice a day, and once a day 30 c.c. of 20 per cent **Dextrose**. G. De Takats and W. D. Mackenzie,⁵ of Chicago, reporting on 30 cases, with an operation mortality of 36 per cent, believe that an increase of diastase in the blood, which it is quite easy to estimate, is a very valuable clue to the diagnosis. In their cases the best results were obtained by early operation, under twenty-four hours, or very late, over three weeks. They warn against doing anything during the initial shock period. If the diagnosis is certain, it is permissible to wait until abscesses need opening, or slough has to be removed. A main object of operating is to drain the infected gall-bladder. H. J. Starling,⁶ of Norwich, points out how frequently a patient with acute pancreatitis, which may end fatally, gives a history of previous attacks of abdominal pain and more or less collapse, often with cyanosis.

Pancreatic Calculi.—F. D. Ackman and A. Ross,⁷ of Montreal, come to the following conclusions:—

1. Pancreatic lithiasis is a comparatively rare condition, there having been only slightly over 100 cases reported.
2. Whereas most of the earlier cases reported were from autopsy findings, the majority in the last fifty years have been successfully operated on.
3. Epigastric pain of both dull and colic-like nature is the commonest symptom, but unfortunately there is no consistency in radiation.
4. Steatorrhœa and diarrhœa attract particular attention in the symptomatology. These symptoms, together with the occasional finding of calculi in the feces, make the examination of the stools of great importance.
5. Glycosuria of true diabetic character is a frequent finding late in the condition. It appears to be coincident with extensive destruction of the islets of Langerhans by the fibrotic pancreatitis which occurs with this condition.
6. Jaundice occurs often enough to lead frequently to the incorrect diagnosis of cholelithiasis.
7. Correct clinical diagnosis is difficult, and though the Roentgen ray is of great value it may, as in the authors' case, not be conclusive, while even at operation stones may be missed, particularly if single. A peculiar crepitus when multiple stones are present has been described.
8. Surgical treatment has yielded very gratifying results from every standpoint. The mortality rate is less than 6.5 per cent. When properly treated the presence of diabetes mellitus does not constitute a contra-indication to operation.
9. Characteristic pathological changes occur in the parenchyma of the gland, beginning as a chronic interlobular pancreatitis and gradually involving the whole gland in a fibrotic process, with resultant atrophy and loss of parenchyma. The islets of Langerhans are last to be involved.
10. The calculi are composed for the most part of calcium carbonate and calcium phosphate. These findings are suggestive of an inflammatory etiology.
11. Associated pulmonary tuberculosis has been noted in a number of cases. The incidence of this is, however, probably not more than might be expected in diabetes mellitus generally.
12. A typical case is reported with a history of twenty-five years, and with the autopsy findings. Glycosuria was present during the last five years

PLATE XXXVIII

THE DRINKER RESPIRATOR



Showing Drinker respirator for the prolonged artificial respiration of newborn infants. The rate and depth of artificially induced breathing, induced by rheostat-controlled motors, air pump, and valve, are registered by the manometer.

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of the condition and active pulmonary tuberculosis only during the last six months.

Hyperinsulinism and Hypoglycæmia.—Three American papers deal with this subject, by E. Starr Judd, F. N. Allan, and E. H. Rynearson,⁸ of the Mayo Clinic, E. Holman and O. C. Railsback,⁹ of San Francisco, and Evarts Graham and N. A. Womack,¹⁰ of St. Louis. Quite a number of cases have now been recorded. The patient is usually middle-aged. He has a succession of attacks whenever he is hungry like those due to an overdose of insulin, promptly relieved by taking carbohydrate food. The symptoms may be sensations of weakness, unconsciousness, or convulsions, or he may behave as though drunk. The diagnosis is proved by the low blood-sugar. At operation, or autopsy, a growth of the pancreas may be found, or overgrowth of the islet tissue. Eight cases have been operated on at the Mayo Clinic; three showed marked improvement after removal of innocent growths, or pancreatic tissue. Holman had a successful case, and Graham three others. On several occasions the surgeon has found two tumours in the pancreas. (*See also* HYPOGLYCÆMIA.)

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1932, Nov., 652; ²*Clinical Jour.* 1933, May, 203; ³*Bull. et Mém. Soc. nat. de Chir.* 1933, April, 612; ⁴*Arch. f. klin. Chir.* 1932, July, 397; ⁵*Ann. of Surg.* 1932, Sept., 418; ⁶*Guy's Hosp. Rep.* 1932, Oct., 269; ⁷*Surg. Gynecol. and Obst.* 1932, July, 90; ⁸*Jour. Amer. Med. Assoc.* 1933, July, 99; ⁹*Surg. Gynecol. and Obst.* 1933, March, 591; ¹⁰*Ibid.* April, 728.

PANEL PRACTICE. (*See* NATIONAL HEALTH INSURANCE PRACTICE.)

PARALYSIS, FACIAL. (*See* FACIAL PARALYSIS.)

PARALYSIS OF RECURRENT LARYNGEAL NERVE. (*See* RECURRENT LARYNGEAL NERVE PARALYSIS.)

PARATHYROID GLANDS, DISORDERS OF.

W. Langdon Brown, M.D., F.R.C.P.

Hyperparathyroidism.—It was only to be anticipated that once the connection between *generalized osteitis fibrosa* and parathyroid tumours was established, the disease would be found to be more common than had been previously realized. Invalid patients who have been sitting in chairs or lying in bed for years have been re-examined, and in a good many—one may suspect that sometimes in too many—cases the diagnosis of hyperparathyroidism has been made and parathyroidectomy has been performed.

The success following the removal of parathyroid tumours has naturally encouraged surgeons to perform the operation for other bony conditions associated with a raised blood calcium. H. Gaudier and G. Patoir¹ report relief in one case of osteo-arthritis with a blood calcium of 14 mgrm. per cent, but in another case with a blood calcium of 13 mgrm. hardly any benefit resulted, though in both cases the blood calcium fell to normal. The parathyroid tissue removed showed no significant change.

Max Ballin² reports instances, and reviews others, where the operation has been carried out not only for osteo-arthritis, but for Paget's disease, juvenile bone changes resembling osteogenesis imperfecta, and for myasthenic conditions. Certainly the resemblances between Paget's disease and osteitis fibrosa are more striking than the differences, but there is at the present time rather too much of a tendency to remove parathyroid tissue for many bony and muscular diseases of hitherto unknown pathology.

J. D. Camp,³ from X-ray study of clinical hyperparathyroidism and the effect of injections of parathormone in animals, finds that a miliary granular osteoporosis is the earliest bony change. He regards this as a valuable diagnostic

measure, making possible the early detection of a parathyroid tumour, and the avoidance of operations on the glands in unsuitable cases such as osteomalacia. P. Frugoni,⁴ on the other hand, obtained entirely negative results in attempting to reproduce the syndrome of hyperparathyroidism by injections of Collip's hormone into animals.

H. Cohen and R. E. Kelly⁵ report three cases of generalized osteitis fibrosa much improved by operation. It is interesting to note that an abnormally high serum calcium was not always found, though an increased excretion of calcium in the urine was always demonstrated. The phosphorus metabolism was invariably disturbed, but no constant relation between this and the calcium could be shown either before or after operation. Evidently the changes in the phosphorus are the more important.

C. Frugoni and R. Alessandri⁶ report the first operation performed in Italy for this, while J. Hellström⁷ reports two cases treated by operation and one by X-ray therapy in Stockholm. He was favourably impressed by this latter treatment on the bony change, although the blood calcium remained as high as 14 mgrm. per cent. Hans Hanke⁸ reports two fatal cases.

Hypoparathyroidism.—For post-operative tetany P. Schultzer⁹ recommends injections of parathormone in association with oral administration of calcium chloride and vitamin D. As soon as the blood calcium returns to normal the hormone injections are stopped and the level of the calcium is maintained by the other two remedies. He mentions that the injections of parathormone do not continue to have the same effect when used for a longer time than that stated, herein agreeing with the views expressed in the MEDICAL ANNUAL for 1933. R. Ellsworth,¹⁰ while advocating 5 grm. of calcium chloride daily, rather surprisingly noted the precipitation of acute tetany after viosterol.

REFERENCES.—¹*Bull. et Mém. Soc. nat. de Chir.* 1932, July 23, 1154; ²*Ann. of Surg.* 1932, Oct., 649; ³*Jour. Amer. Med. Assoc.* 1932, Dec. 3, 1912; ⁴*Policlinico* (Sez. Med.), 1933, March, 164; ⁵*Brit. Jour. Surg.* 1933, Jan., 472; ⁶*Policlinico*, 1932, Nov. 14, 1767; ⁷*Acta. Chir. Scand.* 1932, lxi, 237; ⁸*Arch. f. klin. Chir.* 1932, Nov. 366; ⁹*Acta Med. Scand.* 1932, Fasc. i-ii, 15; ¹⁰*Bull. Johns Hopkins Hosp.* 1933, Feb., 131.

PARATYPHOID FEVERS. (See also TYPHOID FEVER.)

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—According to A. Boczk¹ bacteriuria occurs in about 40 per cent of all cases of paratyphoid fever B. The organisms may be found in a healthy urinary system or in one that is already the seat of disease as the result either of congenital malformation or of a previous infection. Bacteriuria may develop at any stage of paratyphoid B, but is most frequent when the temperature is beginning to fall or during convalescence. It is mainly due to the presence of renal abscesses of various size with secondary involvement of the urinary tract especially the pelvis. The abscesses are chiefly localized in the cortex, but they may also be found in the medulla. The bacteriuria may be transient when the abscesses are small and few, continuous when they are large and more numerous, or intermittent when they burst at different times. The functional symptoms are very slight in spite of the secondary infection of the urinary tract, and the presence of nephro-pyelo-uretero-cystitis can only be discovered by cystoscopy and urethral catheterization. Owing to various causes such as the number and virulence of the organisms, the condition of the urinary tract, or a superadded infection, the infective process becomes more intense and pyelocystitis develops. The acute stage lasts only one or two weeks, but convalescence is protracted. The prognosis as regards life is good, but should be reserved as regards the local condition. In obstinate cases the necessity of an operation such as nephrotomy must be considered.

A. Lemierre and A. Bonnard² report a case of paratyphoid B complicated

by *gas gangrene*. The patient was a youth, aged 18, who on the sixth day of disease was given an intramuscular injection of 5 c.c. of camphor oil on the outer aspect of the thigh. A few hours later gas gangrene developed at the site of injection, and death ensued in less than two hours in spite of free incision. No autopsy was held, but the causal organism was found to be a bacillus of the *perfringens* group, the spores of which were probably in the syringe or needle used for the injection.

A case of *spontaneous pneumoperitoneum* occurring in paratyphoid fever A is reported by P. Harvier³ in a man, aged 26, who had a severe attack of paratyphoid A complicated by profuse intestinal hæmorrhage. On the fifty-fourth day the abdomen became distended, the liver dullness disappeared, and there was slight muscular resistance on the right side of the abdomen. A few days later X rays showed the presence of pneumoperitoneum, which could only be due to intestinal perforation. There were no other symptoms of perforation, however, and the pneumoperitoneum disappeared spontaneously in about three weeks. This appears to be the only example of spontaneous pneumoperitoneum occurring in paratyphoid fever, but Füllsack in 1930 reported a fatal case of typhoid fever in which spontaneous pneumoperitoneum was diagnosed as in the present case by radioscopy.

DIAGNOSIS.—R. Olinesco and L. Busila,⁴ who record two illustrative cases, state that in a malarial region where a laboratory is not available, it is very difficult to distinguish malaria from other infectious diseases presenting the two principal features of that disease, viz., fever and enlargement of the spleen. Their cases came from a district of Roumania where 50 per cent of the population are infected with malaria. The sole clinical symptoms were fever and splenomegaly, and it was only after repeatedly negative examinations of the blood that malaria was excluded and the possibility of another diagnosis was considered. The first case was that of a woman, aged 45, with enormous enlargement of the spleen, in whom the diagnosis of paratyphoid B was established by a positive blood culture and Widal reaction. The second patient was a boy, aged 10 years, in whom the diagnosis of paratyphoid B was also confirmed by a positive Widal reaction. Both cases made an uncomplicated recovery.

A. G. Kuttner and H. D. Zepp⁵ report seven cases of *Salmonella suispestifer* infection in children, aged from 7 months to 6 years, resembling paratyphoid fever. The source of infection was not discovered. The onset was usually abrupt with anorexia and fever. In the older children abdominal discomfort was noted. Vomiting occurred in 4, and epistaxis in 1. In none was diarrhoea a feature. All had low white counts. The diagnosis in each case was made by isolation of *B. suispestifer* from the blood. All recovered after an illness of from two to four weeks.

REFERENCES.—¹*Thèse de Paris*, 1932, No. 288; ²*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1932, June 13, 920; ³*Ibid.* 1028; ⁴*Spitalul*, 1933, liii, 252; ⁵*Bull. Johns Hopkins Hosp.*, 1932, li, 373.

PARONYCHIA. (See HAND AND FINGERS, INFECTIONS OF.)

PATENT DUCTUS ARTERIOSUS. *Reginald Miller, M.D., F.R.C.P.*

The subject of patent ductus arteriosus is apt to suffer neglect on the grounds that it is rare, that its recognition is difficult, and that as a whole it is too advanced a subject for the practitioner to need to study. Yet in fact it is by no means a great rarity, and its diagnosis, in the majority of instances, is a matter of extreme ease. The memorizing of a very few facts, or the careful study of a single case, will make the condition familiar; nor is its recognition

unimportant, for by an erroneous diagnosis much unnecessary invalidism may be inflicted upon the patient.

Undoubtedly the rarity of patent ductus arteriosus has been exaggerated, probably owing to its non-recognition. In a recent study of the condition by D. C. Muir and J. W. Brown¹ it was found as the sole lesion in 23 per cent of a series of 88 cases of congenital heart disease for the most part occurring in school children. C. B. Perry² diagnosed it in 6 per cent of a similar series.

PHYSICAL SIGNS.—Every child is born with a patent ductus arteriosus which is not associated with an audible murmur. As extra-uterine respiration is established, the ductus should close. Where it fails to do so, there develops a systolic murmur with its area of maximum intensity in the second left interspace next to the sternum, and as this increases in strength it becomes accompanied by a systolic thrill. This is not the characteristic murmur of patent ductus arteriosus, but is all that is present for the first few years of life. Later, at a varying age, but probably not under the age of five years, there is added to the systolic bruit a diastolic accompaniment. It is this biphasic bruit, produced in a dilated pulmonary artery, which is so characteristic. It is loud, often audible all over the chest, but with its area of maximum intensity and its accompanying thrill at the second and perhaps third left interspaces next the border of the sternum; and it is prolonged throughout systole and diastole, and is hence described as continuous, mill-wheel, machinery, etc. This peculiar murmur was first described by A. Gibson³ in 1906.

In addition to this pathognomic murmur there is a second physical sign characteristic of patent ductus arteriosus. This is called 'Gerhardt's triangle or ribbon of dullness', and consists of an area which is dull to percussion above the third left rib close to the sternum. By this means the left border of the heart is carried upwards and inwards to the left sterno-clavicular joint. Gerhardt's triangle can easily be detected in a skiagram of the chest (*Plate XL*).

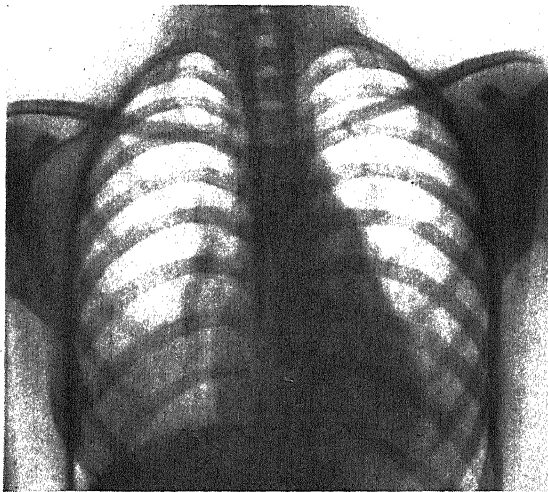
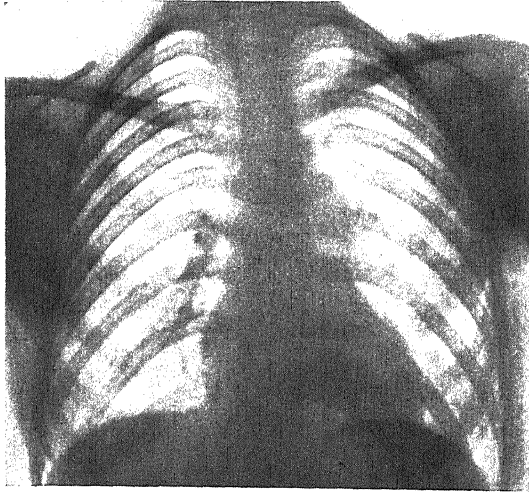
SYMPTOMS.—It is characteristic of patent ductus arteriosus that these very marked and obvious physical signs are accompanied by no symptoms of cardiac insufficiency. Existing as the sole lesion in a case of congenital heart disease, patent ductus arteriosus may be disregarded and the patient allowed full range of activity. Some cases are said to be of frail physique and lacking colour, and indeed there is no reason why they should not be; but where symptoms of breathlessness or cyanosis are said to be present they are due either to some associated lesion such as congenital pulmonary stenosis, or they are due to suggestion. It is not to be wondered at that, in the case of a child, when every doctor either orders it straight to bed or prosecutes urgent inquiries on the subject of shortness of breath or blueness, the maternal solicitude will in time produce the expected symptoms.

DIAGNOSIS.—When fully developed the combination of the characteristic physical signs with an absence of cardiac symptoms makes the diagnosis of the easiest. It can hardly be mistaken for a rheumatic heart lesion. Before the diastolic element of the mill-wheel murmur develops, patent ductus arteriosus has to be differentiated from congenital pulmonary stenosis and patent interventricular septum. From the first it is differentiated by the presence of cardiac symptoms of some degree in pulmonary stenosis; from patent interventricular septum by the fact that the area of maximum intensity of the systolic bruit is at a lower level, usually the fourth space, than in patent ductus arteriosus. Difficulty may also arise where a patency of the ductus arteriosus is complicated by the presence of other congenital cardiac maldevelopments; but a careful examination of the abnormal thrills and murmurs, and an estimation of the degree of cardiac inadequacy present, will usually make the diagnosis

PLATE XL

PATENT DUCTUS ARTERIOSUS

(D. C. MUIR AND J. W. BROWN)



Skiagrams showing Gerhardt's triangle in cases of patent ductus arteriosus.

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clear. In such instances it is useful to remember that thrills are of more localizing value than murmurs, and that in cases of congenital heart disease the presence of a diastolic murmur usually indicates a patency of the ductus arteriosus. It is, of course, only where a patent ductus exists as the sole lesion present that its harmlessness can be ensured.

REFERENCES.—¹*Arch. of Dis. Childh.* 1932, vii, 291; ²*Ibid.* 1931, vi, 265; ³*Med. Press and Circ.* 1906, i, 572.

PELLAGRA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

A good review of the current theories of the etiology of pellagra has been recorded by Harriette Chick,¹ of the Lister Institute, in a lecture in the United States, where so much valuable research work on the subject has been carried out during the last decade or two. The infective theories are put on one side as wanting in any scientific basis and the dietetic theories alone are dealt with, the difficulties in accepting them pointed out, and a suggestion to explain them put forward. The long-recognized close relationship with a diet largely consisting of maize is emphasized, and the work of Goldberger and his colleagues in explaining this relationship on the basis of the low protein value of maize as compared with wheat, etc., and the preventive and curative effects of the addition of meat, milk, and eggs, containing a richer variety of essential amino-acids, is given due weight, but it is pointed out that Goldberger himself recognized that this theory did not account for all the known facts, and McCollum showed that whole-wheat and whole-rice proteins were about equal to those of maize in maintaining the weight of an animal. Moreover, the work of Thomas and others showed that animal proteins, including milk, do not possess a nutritive value much above those of vegetable proteins, so the maize-protein theory has not been supported by recent work, and Goldberger himself in his latter papers regarded a pellagra-preventive vitamin, which he called the 'P-P factor', as an essential deficiency in a pellagra-producing diet. Recent work on B₃ vitamin shows that it is identical with the P-P factor, and it is contained in yeast, which has been shown to be of great value in the prevention and treatment of pellagra without the addition of foods with high protein value. Moreover, work at Lister Institute has shown that B₃ vitamin is also present in liver, eggs, milk, meat, and green vegetables, so largely used in the dietetic treatment of pellagra, while it is relatively deficient in fruits, legumes, and cereals, including the endosperm of wheat, maize, and rice, so that this vitamin is most abundant in just those foods which are also rich in proteins of high biological value.

A theory of vitamin B₃ deficiency as the sole factor in the causation of pellagra, however, broke down when the distribution of that element in cereals was studied by Aykroyd, and it was found to be present in larger quantity in whole maize than in over-milled rice and millet, while in the endosperms of each it was equal and in low amount, so that the absence of pellagra in rice-eating peoples, although they suffer from beri-beri, cannot be explained on this theory. There is the still older Italian theory of Lombroso that pellagra is due to toxins produced in maize by the action of moulds and other micro-organisms, while further the occurrence of the lesions on parts of the body exposed to the sun has led to the suggestion that maize might contain a photosensitizing substance analogous to that in buckwheat; and Sabry in Egypt has recently suggested that intravenous injections of sodium thiosulphate may exert their beneficial results by neutralizing a toxin derived from ingested maize, and there is an analogous theory that beri-beri is due to eating damaged rice. Harriette Chick therefore put forward the suggestion that the known facts might be explained by the hypothesis that some toxic substance derived from

maize may be rendered innocuous by the action of the pellagra-preventive P-P factor or vitamin B₂, as this would account for the curative and preventive action of yeast, liver, milk, and meat—all of which are rich in this vitamin.

The control of pellagra is also discussed by G. A. Wheeler and W. H. Sobrel,² of the United States, where 98 per cent of the 7146 deaths in 1930 occurred in the southern cotton belt, where an increase has taken place with the bad economic conditions due to the fall in the price of cotton, with limitation of the kind and quantity of food crops and lack of availability of certain essential food-stuffs, especially in the spring, when the cases always increase. The disease is preventable by proper diet, as proved by Goldberger's success in reducing the annual pellagrous death-rate in the largest state asylum in the south from 6.2 to 0.1 per cent at a time when the total state deaths increased by nearly 100 per cent. The endemic pellagra is largely the product of the modern one-crop system in the south of the United States, and the writer suggests that the remedy consists in either the home production of a wider assortment of foods by diversifying the crops and maintaining livestock and poultry, or by increasing the food-purchasing power of the people, and he points out that the chances are a thousand to one against finding pellagra in a home with a good garden and a cow or two, a few pigs, and poultry.

REFERENCES.—¹*Lancet*, 1933, ii, 345; ²*Jour. Amer. Med. Assoc.* 1932, July 9, 95.

PEMPHIGUS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

M. B. Sulzberger and F. Wise¹ suggest a line of treatment for this formidable disease which, in their hands, appears to hold out some hope of a cure in certain cases. The basis of the treatment consists of: (1) Large doses of **Arsenic**; (2) Daily high colonic irrigations with large quantities of fluid containing either **Bicarbonate of Soda** or an **Iodine** preparation; (3) Large quantities of **Vitamin D**; (4) Salt-poor, protein-low, vitamin-high **Diet**; and (5) **Trichophytin** or **monilia Vaccine** or both. In addition, local therapy consisting of **Potassium Permanganate** baths, **Ichthyol** ointments and lotions, etc., were used. Five cases are described, two of pemphigus vulgaris, two a combination of bullous and foliaceous pemphigus, and one of pemphigus vegetans. One case was apparently cured; another after complete remission developed a severe recurrence after an abdominal operation and the patient was seriously ill. Two cases were markedly improved, and one case, after definitely improving, developed pneumonia and died. The authors make no claim for any scientific basis for their treatment; they submit it merely as an empirical method which in the present state of knowledge seems to promise better results than those usually obtained in this disease.

The treatment by **Germanin** (Bayer 205) introduced for this disease by Veiel in 1931 has been used in a number of cases in Germany. R. M. Bohnstedt² quotes 21 cases of pemphigus and dermatitis herpetiformis reported up to the time of his paper, with only 2 cases in which no effect was produced by the drug. This author adds another 12 cases of pemphigus and 4 of dermatitis herpetiformis. Of the pemphigus cases, 7 of pemphigus vulgaris and 1 of pemphigus vegetans cleared up. One case of pemphigus vulgaris was improved. Of the 4 cases of dermatitis herpetiformis, 2 cleared up and 2 recurred within six months. The author gives the drug intravenously, beginning with 0.5 grm., then 0.75 and 1.0 grm. every two to three days, up to a maximum of 5 to 6 grm. Occasionally second courses have been given after an interval. He has had no serious side effects from the drug, but a number of the cases show a rise of temperature, generally after the second injection, which falls again at the end of the cure. In some cases the first injection gives rise to an exacerbation of the bullæ. Only quite bland local treatment is given.

K. Speier³ calls attention to the bad prognostic significance of lesions in the mouth in pemphigus. In a series of 24 males and 29 females the percentage mortality in all cases is 50 for males and 51 for females. In cases where the mucous membrane of the mouth is involved the percentage mortality for males is 75 and for females 80.

REFERENCES.—¹*Med. Jour. and Record*, 1932, July 20, 64; ²*Münch. med. Woch.* 1933, April, 7, 522; ³*Ibid.* March 10, 383.

PENIS, SURGERY OF.

Hamilton Bailey, F.R.C.S.

Carcinoma of the Penis.—Carcinoma of the penis appears to be common in the East (Nath and Lal¹). In Siam it forms 9.6 per cent, and in the Punjab 4 per cent, of all cases of carcinoma. In the Siamese, who profess Buddhism, circumcision is not performed unless there are definite surgical indications. Those Indians who profess Mohammedanism carry out circumcision as a ritual during the 4th to the 9th year. In the Jews it is performed upon the 8th day. There is no case on record of carcinoma of the penis in a circumcised Jew. T. P. Noble² asks: "Are the factors acting during the first four to nine years of life sufficient to modify the tissues so as to constitute the foundation for the development of cancer in later life?" In a study of 52 cases of this condition this author finds that the inguinal glands, though usually enlarged, are rarely the site of secondary deposits.

Vincent's Angina of the Penis.—Vincent's angina of the penis occurred in a patient of 24 under the care of W. B. Tatum.³ Two days after coitus a sore appeared on the glans; the patient had also ulceration of the mouth. A smear from one of the buccal lesions showed Vincent's organism; likewise the smear from the penis. Treatment consisted in applying powdered **Neosalvarsan**, and later the same drug was given intravenously. The lesions healed rapidly. His partner had been undergoing treatment for Vincent's angina of the buccal cavity for several months.

Diphtheria of the Penis.—N. E. Berry's⁴ patient was 45. The diphtheritic membrane, which had been present for a month, was so adherent that it could not be stripped off. After treatment with **Antidiphtheritic Serum**, and incision of a peri-urethral abscess, the condition cleared up.

Subcutaneous Rupture of the Corpus Spongiosum during Coitus.—A married man aged 56 noticed sudden pain during coitus. Soon afterwards the penis became swollen, cold, and cedematous distal to an angulation. There were subcutaneous hæmorrhages, and bleeding occurred from the meatus. W. Halloran⁵ made an incision and expressed blood-clot. The torn urethra and corpus spongiosum were then repaired with sutures.

REFERENCES.—¹*Indian Med. Gaz.* 1933, March, 127; ²*Brit. Jour. Urol.* 1933, Sept., 242; ³*Med. Times*, 1932, Jan.; ⁴*Brit. Jour. Urol.* 1932, Dec., 349; ⁵*Minnesota Med.* 1932, Nov., 779.

PERICARDIUM, AFFECTIONS OF. (See also PYOPERICARDITIS.)

A. G. Gibson, M.D., F.R.C.P.

A number of papers dealing with different aspects of pericarditis have been published in America and Canada. H. N. Segall¹ writes an interesting paper on the *detection of the murmur of acute pericarditis*. It is a well-known clinical fact that the presence of pericarditis is often missed in the course of an illness. At times this may have made no difference to the patient's chances, but at other times its discovery might have altered the attitude towards the disease in progress. Segall records a case in which the friction rub of pericarditis was studied. During a period of nine days friction was not heard though examined for repeatedly. On the ninth day a loud to-and-fro leathery type of pericardial murmur was heard all over the sternum during

the time occupied by several heart-beats. It then disappeared and several repetitions of postural changes failed to elicit the murmur. On another occasion with the patient in the dorsal recumbent position the murmur was again produced for about ten seconds after shaking the patient from side to side half a dozen times in quick succession. A more gentle and equally effective method is to put the patient on his right side and to move him several times towards the dorsal recumbent and the prone posture. He remarks that the typical '*cri de cuir*' is not a *sine qua non* of the diagnosis of fibrinous pericarditis. Short soft to-and-fro murmurs, swishing, coarse, or rasping murmurs may also be found. The murmur may be heard over a small area of the sternum or of the precordium, or everywhere over the area of cardiac dullness. It is extremely rare outside the cardiac area or over the back. It varies with the pressure of the stethoscope, and its changes in loudness and audibility are marked and sometimes sudden. This variability is an important item in diagnosis.

The presence of even a large amount of pericardial effusion does not cause the murmur to disappear so long as there is fibrinous exudation of one or both surfaces of the pericardium anteriorly, and any procedure that causes the two surfaces to come into contact will produce friction. Other circumstances may bring out this friction murmur, such as deep breathing, coughing, sighing, yawning, or sneezing. It is therefore important to auscultate after any such act. The author also records Corrigan's observation that the change from the recumbent to the sitting posture may bring it out. This, however, is a procedure not unattended with risk in acute cases.

P. D. Camp and P. D. White² made a clinical study of *pericardial effusion*. They refer to the work of François-Franck in 1877, who demonstrated that fluid injected into the pericardial cavity hinders the entrance of blood into the auricles and causes stasis in the venæ cavæ and a fall of blood-pressure. Later work showed that in the paradoxical pulse which is present in this condition the change was mainly due to the action of varying intrathoracic pressure. The negative pressure during inspiration acting on the veins entering both right and left auricles produces a lessened amount of blood entering each ventricle. The *pulsus paradoxus* therefore appears in both pulmonary and systemic circuits. The statement of Cabot is quoted that 150 c.c. of fluid is the least amount that produces a change. No change occurs in the cardiac dullness until 400 c.c. are present. Out of a total of 1729 necropsies, 126 (7·2 per cent) showed a pericardial effusion of 100 c.c. or more. These cases form the substance of the paper, and are examined both from the anatomical and clinical aspect. Pain was present in 24 out of 26 (92·3 per cent), dyspnoea in 68, orthopnoea in 37, distended cervical veins in 5, pericardial friction in 8, distant heart sounds in 29, and *pulsus paradoxus* in 1. Forty-nine of the patients were examined by X rays and a correct diagnosis made in 1 case only by this means, but it was doubtful in 3 others. Including the cases in which X rays were not used, the diagnosis was made in 6 instances. It is obvious that much needs to be done in perfecting methods of diagnosis.

H. L. Smith and F. A. Willius³ also deal with pericarditis with effusion. The most reliable sign would appear to be the size and contour of the heart as determined by X rays. This consists of bulging at the lower angles of the cardiac shadows whither the fluid gravitates. Other signs are distant and muffled heart-sounds, diminution or obliteration of the apex beat, and compression of the left lung (Ewart's sign), though this may be present with enlarged heart as well as with pericardial effusion. Enormous effusions sometimes produce compression of the œsophagus and trachea, with dysphagia and respiratory obstruction. Their conclusions from a study of 113 cases observed

post-mortem are that the presence of intrathoracic disease is the main factor in the production of pericarditis; especially is this so if the disease is infective.

The same authors⁴ write on *chronic adherent pericarditis*. They remark on the great difficulty of diagnosis and that the so-called characteristic signs exist in relatively few cases. Further, that the occurrence of other disease unrelated to the cardiovascular system may so dominate the clinical interest that attention is diverted from the pericardium, and that disease of the heart may satisfactorily explain the physical signs. Taking adherent pericardium in its widest sense, the etiology was determinable in 50 per cent of a total of 73 cases. Rheumatic fever accounted for 21 per cent, intrathoracic infection for 17.4 per cent, cardiac infarction for 6.2 per cent, and syphilis for 2.8 per cent. The pericardial sac was completely obliterated in 38 per cent, while in 8.3 per cent there were fairly extensive parietal adhesions to surrounding structures. Some portions of the pericardium were calcified in 10.4 per cent. Pericarditis does not seem to have any effect *per se* in causing hypertrophy, and this is true even of complete obliteration. In slightly over one-third of the cases complaints were mainly referable to the heart. Out of these, 3 cases only were found of polyserositis. The heart was enlarged in 37 (50 per cent), and there was no characteristic syndrome. The etiological factors concerned are important in directing the clinical attention to the possibility of this lesion, especially the history of rheumatic fever, intrathoracic infection, early cardiac infarction, and intrathoracic cancer.

H. B. Sprague, H. A. Burch, and P. D. White⁵ refer to *Pick's syndrome of constricting pericarditis and recurrent ascites*. This was found in 2.26 per cent of 1900 necropsies at the Massachusetts General Hospital. In one case a boy of 18 had had enlargement of the abdomen and ascites for four years. Another case, a woman aged 23, who died with congestive heart failure, had had painless ascites for eight years following mumps and whooping-cough. Seven years previous to death she had been operated upon at the Boston City Hospital, when the peritoneum was found studded with tubercles. At the necropsy the pericardium was found to contain cheesy matter, but no culture was made, and there was no sign of pulmonary or peritoneal tuberculosis. A third case, a man aged 29, had had pneumonia and pleurisy three years previously. The authors conclude that Pick's syndrome depends upon tuberculosis.

H. L. Smith and F. A. Willius⁶ found among the patients in the Mayo Clinic 16 proved cases of *calcification of the pericardium*. In one of these only was the diagnosis made during life from an X-ray examination. The common etiological feature was rheumatic fever, and tuberculosis was not present in any of the proved cases. Calcification is a sequel of extensive chronic adhesive pericarditis and is an end-result.

REFERENCES.—¹*Arch. of Internal Med.* 1933, Jan., 62; ²*Amer. Jour. Med. Sci.* 1932, Dec. 782; ³*Arch. of Internal Med.* 1932, Aug., 192; ⁴*Ibid.* 171; ⁵*New Eng. Jour. Med.* 1932, Sept. 15, 483; ⁶*Arch. of Internal Med.* 1932, Aug., 184.

PERITONITIS.

A. Rendle Short, M.D., F.R.C.S.

Serum Treatment of Peritonitis.—This continues to attract considerable attention in Central Europe. Papers on the subject appear by a number of authors, including M. Gundel and F. Sussbrick,¹ of Heidelberg, H. Krabbel,² of Aachen, E. Reichl,³ of Vienna, A. Schmechel,⁴ of Cologne, F. Prochnow,⁵ of Budapest, and H. Vincent,⁶ of Paris. Various preparations are in use, notably anti-colibacillary, anti-enterococcus, and anti-gas-gangrene sera.* A

* Bayer Products Ltd., Africa House, Kingsway, London, W.C.2.

favourite preparation in Germany is 'Polyvalent Peritonitis-serum Höchst', and Vincent has put an anti-colibacillary serum on the market in France. These may be given subcutaneously or by injection into the peritoneum, or both. Intravenous injection has led to a fatality, so is better avoided. Good results are claimed in conjunction with surgical treatment, in cases of early peritonitis, from appendicitis, and other causes. Schmechel is not convinced of the value of serum therapy; the others are.

Encapsulating Chronic Peritonitis.—This is a variety of chronic peritonitis, of unknown cause, showing opaque white thickening of the peritoneum, with thickening and puckering of the mesentery, perisplenitis, and perihepatitis. The main symptom is a recurrent ascites calling for repeated paracentesis. It was originally described by Fagge and Hale White. The Germans call it 'icing-sugar intestine'. H. B. Devine² describes two cases in which it led to acute intestinal obstruction owing to the formation of a tumour-like mass consisting of intestines and other viscera wrapped up in a tough whitish adherent membrane (*Plate XLI*). There are attacks of colicky pain and dyspepsia in the earlier stages, going on later to multiple stenosis. If the patient comes to operation, the crucial problem is to seek a line of cleavage where the peritoneum is reflected on the intestine. This can be followed up and the bowel partially decapsulated and unravelled without much difficulty. Enterostomostomy is only to be attempted as the last resort, as, if the intestine is cut into, the contractile membrane may turn the gut inside out. The condition got well spontaneously in one of Devine's cases.

REFERENCES.—¹*Deut. Zeits. f. Chir.* 1933, May, 283; ²*Zentralb. f. Chir.*, 1932, Nr. 29, 1754; ³*Wien. klin. Woch.* 1932, Oct., 1288; ⁴*Deut. Zeits. f. Chir.* 1933, June, 636; ⁵*Arch. f. klin. Chir.* 1933, Feb., 349; ⁶*Surg. Gynecol. and Obst.* 1933, Jan., 66; ⁷*Brit. Jour. Surg.* 1932, Oct., 204.

PERITONITIS, PNEUMOCOCCAL AND STREPTOCOCCAL, IN CHILDREN.

John Fraser, Ch.M., F.R.C.S.Ed.

The subject of peritonitis in children is discussed from the general viewpoint by S. D. Lazarus.¹ He contrasts three varieties of the disease—pneumococcal, streptococcal, and the secondary variety which results from a local area of infection. He emphasizes the true, but often imperfectly appreciated statement that a primary peritonitis, whether pneumococcal or streptococcal, is at first general and later local, while in the secondary varieties the reverse sequence occurs.

Perhaps the main interest of his paper deals with the influence of *nephrosis* as a factor in the origin of pneumococcal and streptococcal infections of the peritoneum. It has long been recognized that a child who suffers from nephritis, and particularly one whose kidney error is associated with ascites, is liable to develop a pneumococcal or a streptococcal infection. Lazarus points out that relatively little is known regarding the factors which influence the development, and he makes a plea for further work on the subject.

The primary types of peritonitis formed one of the subjects of discussion at the Meeting of the British Medical Association in London in July, 1932. The subject was introduced by L. E. Barrington-Ward, and summaries of his paper have been published.^{2, 3} He recounted his experience of 20 cases of pneumococcal peritonitis and 22 cases of streptococcal peritonitis as observed over a period of fifteen years. The basis of the paper and the subsequent discussion might be said to centre round three questions: (1) How does the disease arise? (2) How may it be diagnosed? (3) How best may it be treated? In regard to the first query no definite answer was advanced, though it was indicated that there is considerable evidence in support of two avenues—the genital tract in female children, and a blood conveyance

secondary to respiratory infections. The problem of diagnosis presents many difficulties, and, as Barrington-Ward points out, a careful analysis of the clinical findings is perhaps the most reliable method at our disposal; but in a certain proportion of cases doubt must necessarily exist, and in these the method of peritoneal puncture may afford important information.

In this connection O. Loewe⁴ recommends and practises a puncture through the posterior fornix of the vagina (Fig. 75). He regards this as safe, and more likely to yield positive results than the method of abdominal puncture. After all is said and done, however, abdominal exploration, if strictly limited in its extent, is in many cases the most satisfactory procedure.

In so far as treatment is concerned, there is a growing feeling that, if the diagnosis of a *pneumococcal* infection is confirmed, the best course to adopt is to delay interference until the peritoneal inflammation has become localized, and to use intravenous **Serum Therapy** as a means of countering the general infection. This aspect of the question is stressed by B. Paz and D. Bobillo,⁵ who recommend delay in operation until a period between the twentieth and twenty-fifth day.

A. Bréchet⁶ reviews the problem in a most helpful article. After discussing the various clinical manifestations, he says, "There is no clinical symptom which *per se* is of sufficient value to enable us to arrive at a trustworthy diagnosis"; and his final conclusion amounts to this—that non-intervention is too risky, and that the line of greatest security is to practise a right iliac exploration of a strictly limited extent.

Barrington-Ward, in his address at the Meeting of the British Medical Association, made the statement that he had never witnessed recovery in a single instance of streptococcal peritonitis. That such a conception is unduly pessimistic is suggested by G. G. Bruce and M. J. Logie,⁷ for they publish the case histories of three children who made good recoveries following operation for acute general peritonitis of a streptococcal type.

REFERENCES.—¹*Amer. Jour. Surg.* 1932, July, 70; ²*Brit. Med. Jour.* 1932, ii, 704; ³*Lancet*, 1932, ii, 343; ⁴*Zentrabl. f. Chir.* 1932, Dec. 17, 3049; ⁵*Semana Med.* 1932, April 28, 1316; ⁶*Med. Press*, 1932, Sept. 21, 231; ⁷*Brit. Med. Jour.* 1932, Feb. 18, 270.

PERTUSSIS. (See WHOOPING-COUGH.)

PHARMACOLOGY AND THERAPEUTICS. (See also INSOMNIA AND THE USE OF HYPNOTIC DRUGS.) Ivor J. Davies, M.D., F.R.C.P.

Cinchophen.—J. S. Davis¹ (New York) has studied 200 cases taking neocinchophen (tolysin) or cinchophen (atophan). No fatal results were observed in these cases, but 30 had some slight circulatory upsets. None was jaundiced. A preliminary study on the excretion of cinchophen and neocinchophen preparations in human beings and dogs yielded the definite result that cinchophen develops a laevorotatory activity in the urine. In human beings most of the cinchophen is excreted within three to six hours after ingestion. In the urine of animals taking neocinchophen no such substance has been

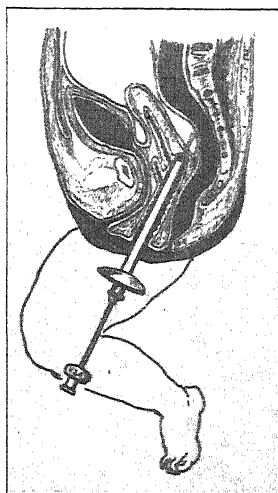


Fig. 75.—Showing the puncture trochar and cannula in position. (By kind permission of 'Zentralblatt für Chirurgie'.)

found. The superiority of neocinchophen for general clinical use appears at the present time a fair conclusion from the evidence of the literature and the author's cases. It is important to give a small initial dose to determine sensitivity. In reading the literature of the cinchophen poisoning cases, the author was struck with the number of cases whose toxic symptoms began after the drug had been discontinued and then recommenced. Thus one should be doubly cautious in again administering the drug.

Immunotherapy.—L. P. Garrod² reviews the progress of recent developments in immunotherapy and draws attention to three important new methods of immunization, each depending upon a different principle. Inoculation with living, but attenuated, bacteria is represented in the use of B.C.G. (*Bacille Calmette-Guérin*), a method still in the experimental stage, but offering at least some hope of immunization against *tuberculosis*. Inoculation with preparations of bacterial toxin has been shown to be capable of producing immunity to diphtheria and scarlet fever. The injection of serum from recovered human cases can be used at will either to prevent or to attenuate an attack of measles, and possibly to modify the course of other infections.

Preventive inoculation deserves a wider application in *whooping-cough*. On its appearance in a family or school, the remaining children may be treated with a *B. pertussis* vaccine with at least an expectation of mitigating the severity of the disease should they contract it. The same remarks apply to immunization against *diphtheria* and *scarlet fever*. The ideal treatment of *measles* in a family where the day of exposure to infection can either be placed accurately or deliberately arranged is unquestionably to give convalescent serum on about the seventh day and thus secure a mild attack with subsequent permanent immunity. Although these methods can be applied on a large scale only by the action of public health authorities, their employment in individual cases or in small communities remains to a large extent the duty of the individual practitioner, who may find in them the means of performing valuable service.

Mercurochrome.—W. F. von Ottingen and associates³ (Cleveland) have made a comparative study of mercurochrome and other antiseptics. The following conclusions were drawn from their investigation. It appears that mercurochrome, when once fixed on the surface of the tissue, develops no bacteriostatic action in contact with bacterial cultures. It penetrates only into the dead or dying mucous membranes of different organs, such as bladder, vagina, and digestive tract, and it may diffuse through the cornea when in contact for a sufficient period. It does not penetrate the living skin, but is fixed in the most superficial layers of the epithelium, and it does not penetrate or stain normal muscular tissue. It penetrates necrotic and dead tissue and stains them deeply and permanently. The tissue toxicity of mercurochrome is relatively low, but the 5 per cent aqueous solution is distinctly injurious as judged by excised ciliated mucous membranes. Mercurochrome cannot be relied upon to destroy bacteria that have penetrated into the living tissue of a wound or of the skin: it could do no more than disinfect the surface and the necrotic tissue. This limitation is shared more or less by all antiseptics, so that no substance can properly be called a safe and certain wound antiseptic. No antiseptic takes the place of thorough cleansing and surgical treatment. When these are not practical, for 'first aid' or for very superficial wounds, antiseptics are probably better than no treatment at all. The antiseptic efficiency of mercurochrome is not outstanding, and for skin disinfection the aqueous solution is distinctly inferior. The absence of irritation may be an advantage, especially with open wounds, and for prolonged treatment; but its limitations should always be borne in mind.

Non-specific Protein Therapy.—G. W. Bray⁴ (London) has written a comprehensive article on non-specific protein therapy. The agents elaborated in the past fifteen years with the idea of flushing specific antibodies into the circulation are legion, and it is doubtful if any possess the special virtues which their manufacturers claim. They all have one point in common, the ability to cause a more or less febrile reaction, hence the term 'pyrogenic therapy'. In their clinical application, familiarity with one or two agents and the practical accumulation of personal knowledge of the dose necessary to produce the desired reaction will prove more beneficial in a series of cases than meddling with many. The secret of their use lies in never using them when proved specific measures are available, and when employing them to commence early in the disease, give them slowly, and use small doses at the start. Good prompt reactions can be obtained with typhoid vaccine intravenously, and moderate delayed reactions by the use of peptone or milk intramuscularly. At their best they are only of proved value in a limited number of picked cases of certain diseases, so that too much must not be expected of them. Nevertheless, they may keep a patient interested whilst Nature cures him.

The agents most commonly used are blood and sera, milk, peptone, typhoid vaccine, or the mixed typhoid and paratyphoid vaccine is often used. It is in cases of *arthritis* that non-specific protein therapy is most commonly employed. In *gonorrhœa* and its complications, such as arthritis, prostatitis, epididymitis, and tubal infections, non-specific therapy often proves more beneficial than specific. In *allergic conditions* non-specific therapy has been used to advantage. Non-specific desensitization should only be employed when specific causes cannot be determined or their removal or injection has failed. Auto-hæmotherapy and auto-serotherapy are employed with advantage in *urticaria* and *angioneurotic œdema*, especially of the recurring type, and often they form the only treatment that brings any relief, and they are also useful in many other intractable *dermatological conditions*. In most of these skin affections non-specific protein therapy increases the susceptibility of the lesions to local treatment and so hastens the cure.

In *general paralysis of the insane* remarkable results have been obtained with typhoid vaccine or malarial therapy. In manifestation of the hæmorrhagic diathesis preference should be given to the use of human serum rather than horse serum. More recently non-specific therapy has been employed to produce vasodilatation in *Raynaud's disease*, *thrombo-angiitis obliterans*, and *arteriosclerotic gangrene* with gratifying results. The contra-indications to this form of therapy are described. The original article deserves careful perusal by the practitioner, who can by this means often obtain results in what are otherwise obstinate states.

Oxygen.—W. R. Potts, jun.,⁵ makes a comprehensive critical résumé of oxygen therapy and quotes from an extensive bibliography. He concludes that the interest in oxygen therapy has been of considerable magnitude during the past decade. It seems quite certain that oxygen therapy has definitely established itself in our therapeutic armamentarium. In those conditions associated with easily recognized anoxemia and in the more obscure conditions as they are recognized, the use of oxygen must find its place. Our knowledge must increase greatly before we can speak upon this subject with anything like finality. The time is at hand, however, when oxygen must be given a trial in serious heart and pulmonary conditions. That carbon dioxide will supplement oxygen seems possible, and a valuable supplement it bids fair to be. It is only possible to refer here to a few of the practical deductions drawn from Potts's paper. The importance of avoiding the development of *cyanosis*, if possible, cannot be over-emphasized. The distribution of the cyanosis is

of interest in that the most constant and frequent site was found to be in the ends of the fingers, especially under the nail. At present it is felt that the optimum concentration of oxygen is between 40 and 60 per cent. Any method which can supply a concentration above 30 per cent continuously and comfortably is of value. The nasal catheter method which is universally available will, when properly employed, furnish up to 35 per cent. Its use should be continuous—day and night—if this is necessary to keep the patient comfortable. "Keep the finger nails pink" is a criterion described by one clinician. Slowing of the pulse occurs commonly, and is an indication that the rapidity of the pulse due to the anoxæmia is being relieved. The mass of the reports in the literature favour the early and continuous use of oxygen in *pneumonia*. It is evident from the reports that a high degree of anoxæmia in pneumonia is accompanied by a high mortality. In *heart disease* it would seem that, in the presence of low arterial oxygen saturation, while an old damaged heart cannot be repaired fully by oxygen, nevertheless much of the acute distress so often seen in cardiac decompensation may be avoided to a large extent. During the time that digitalis, diuretics, and morphine are taking to produce their effects it may be possible to put these patients in relative comfort by the use of oxygen.

The employment of oxygen in *coronary thrombosis* is of undoubted value. A concentration of 50 per cent has aided in maintaining an adequate oxygen supply to the tissues of the body until the heart has had an opportunity to recover from its functional disturbance.

Reference is made to the work done at the Mayo Clinic in the use of oxygen in *surgical conditions*. Judd states that there are certain types of operations in which pulmonary complications are more likely to follow, such as interventions in the upper organs of digestion for cancer of the stomach, ulcer, gastrojejunal fistula, biliary obstruction, and operations on the pancreas. Effort has been directed towards the development of some hygienic or therapeutic method that might minimize the possibility of post-operative pneumonia. It appears to them that since the use of the oxygen tent has been instituted they do not have in their service the incidence of pneumonia that they had at other times. It seems likely, however, that carbon dioxide will supplant oxygen to a large extent in the treatment of the post-operative complications.

L. N. Katz, W. H. Hamburger, and S. H. Rubinfeld⁶ (Chicago) record their observations on the effects of oxygen therapy. A comparison of the effects of oxygen therapy on the circulation and respiration of a group of cardiac and 'noncardiac' patients was used as a check on the clinical impressions, and to determine whether these changes preceded, accompanied, or followed the clinical improvement. A modified direct venous pressure method is described, and also a simple clinical method of determining minute volumes of respiration. Oxygen therapy tended to decrease the vital capacity slightly. It caused no significant changes in arterial and venous pressure. An increase in the amplitude of the QRS complex and in the size and duration of the T wave was found in the majority of cases during exposure to an oxygen-rich atmosphere. Oxygen therapy was found to result in: (1) A slowing of the heart by causing a sinus bradycardia; (2) A decrease in minute-volume of respiration; and (3) An increase in the length of time the breath could be held.

D. J. Cohn, L. N. Katz, S. Soskin, and W. H. Hamburger⁷ (Chicago) studied the blood chemical changes of oxygen therapy, and concluded: The function of oxygen therapy is not to attack the underlying causes of the disease, but to give the patient the benefit of as high a blood-oxygen saturation as possible. It is conceivable, as was pointed out in a previous report,⁸ that some of the benefits of oxygen therapy may be produced in other ways besides

the improvement of arterial anoxæmia. However, the major benefit of oxygen therapy is the increase in oxygen saturation of the arterial blood, thus relieving the arterial anoxæmia and its effects.

E. P. Poulton⁹ (London) describes a new form of bed-tent* for administering oxygen and carbon dioxide (*Fig. 76*), which presents the following new features: (1) Cooling and drying are effected by means of ice tins let in through the roof of the tent. (2) Ventilation is produced by means of an injector as described by Cecil and Plummer; but the stream of oxygen with

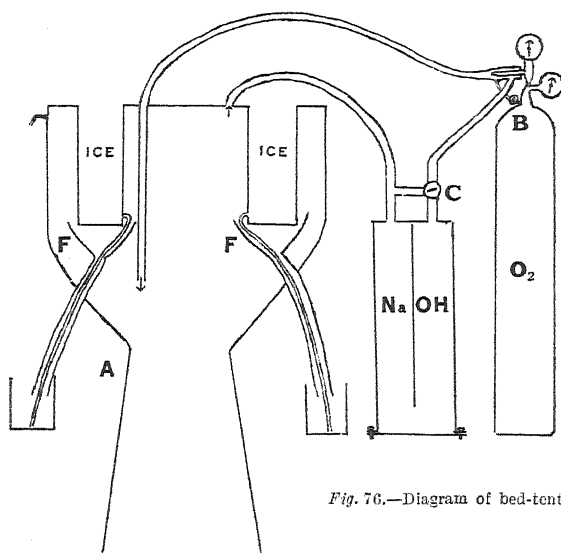


Fig. 76.—Diagram of bed-tent.

the ventilation can be varied. (3) CO_2 is administered by partially short-circuiting the CO_2 absorption box. A clinical oxygen-measuring pipette by E. P. Poulton and J. W. Shackle is also described.

Radium.—H. A. Colwell and S. Russ¹⁰ (London) publish a timely article on radium as a pharmaceutical poison. In this country but little has yet been heard of the effects of radium as a poison, but in the United States poisoning by radio-active substances has been made the subject of at least two official publications by the public health authorities. They refer mainly to the employment of radio-active substances by unqualified practitioners and laymen, but first they review the legitimate use of these substances, dealing secondly with some of the deleterious effects produced by their industrial use and internal administration under untrained directions. Attention was first drawn to the toxic effects of radium by H. S. Martland in 1925. The cases occurred among women employed in painting luminous watch dials at a factory in New Jersey, U.S.A., and the first case was one of necrosis of the jaw which was at first supposed to be syphilitic; subsequent cases occurred, and up to May, 1931, 18 deaths had been recorded among these workers. Investigation showed that the results, sometimes fatal, were due to poisoning by the radio-active materials used in preparing the luminous paint. The girls made a habit

* Marketed by Siebe Gorman & Co. Ltd., 187, Westminster Bridge Road, London, S.E.1.

of 'pointing' in the mouth their brushes charged with the radio-active material. Osteitis, necrosis, and blood changes were among the conditions produced. Five patients developed bone sarcomata, some showing extensive metastatic deposits in the internal viscera.

The point which is of especial interest here is a comment by the same author upon the sale of radio-active waters "for the cure of everything from ingrowing toe-nail and alopecia areata to the sexual impotence of senescency, high blood-pressure, chronic arthritis, and arterio-sclerosis". Reference was made to two specific instances where the unfortunate patients had been induced to swallow vials of mesothorium and radium for between one and two years. Both developed necrosis of the superior maxilla, and in one case there was almost complete sloughing of the bone. The presence of radio-activity in both of these sufferers was demonstrated and measured by physical methods.

There is no doubt that the public here as well as in other countries is being exploited by being induced to buy 'radium preparations' which are in most cases devoid of any therapeutic value, and, what is far worse, are likely to be injurious to those that use them. The preparations are varied, and range from drinking-waters and pills to hair-restorers, soaps, and other toilet preparations, as well as to confectionery, such as chocolate. The advertisements of these nostrums are usually framed in a manner to catch the eye, and involve the promised cure of a whole host of diseases. The first-named authors claim that all radio-active preparations designed for internal consumption or intimate tissue contact should (if their sale cannot be absolutely prohibited—and why not?) be clearly labelled 'poison' and generally made to comply with the regulations governing the sale of poisons. (See also TOXICOLOGY.)

Urinary Antiseptics (see also articles URETER, SURGERY OF; URINARY ANTISEPTICS).—H. F. Helmholz¹¹ emphasizes the fact that in the treatment of urinary infections with **Methenamine** a great variety of results have been reported. The effectiveness of the drug is dependent on the splitting off of formaldehyde in an acid medium in an amount corresponding to the concentration of methenamine, the acidity of the medium, and the time for action. Treatment with this antiseptic without constant control of the pH of the urine is likely to be unsuccessful.

E. Davies and J. C. Sharpe¹² (Omaha, Nebraska) have studied the clinical efficiency of **Methenamine**, **Caprokol**, **Pyridium**, and **Acriflavine** in urinary antiseptics. The following summary is drawn from their investigations.

1. As determined by antiseptic tests made before and after administration, pyridium, given in capsules to normal persons in unit maximum dosage (0.4 grm.), colours the urine.

2. Caprokol (dose, 0.75 grm.), judged by the same standard, exerts an irregular and transient antiseptic action in about one-third of the four-hour samples.

3. Methenamine (dose, 1 grm.) is incomparably more efficient than either pyridium or caprokol in causing the normal person to secrete urine which is antiseptic against both the colon bacillus and the staphylococcus.

4. Acriflavine (dose, 0.2 grm.) administered in capsules exerts an antiseptic action in normal urine against both the colon bacillus and the staphylococcus, which is uniform and consistent to a surprising degree. Urinary alkalinity is essential.

5. Acriflavine (dose, 0.2 grm.) administered in shellac-coated pills is practically inert.

6. Acriflavine administered in capsules, although non-injurious in efficient dosage, causes unpleasant symptoms (nausea and catharsis) in a fair proportion of cases.

7. Acriflavine, for the reason given, has its definite clinical limitations. Clinical experience indicates, however, that this drug is of distinct value in selected cases, particularly those of acute infections of the urinary tract.

Thus it will be seen in their tests that pyridium is practically inert, eaprokol is slightly antiseptic, methenamine is quite efficient, and acriflavine (in alkaline urine) is unfailing.

W. B. Tatum¹³ (Brooklyn, N.Y.) used pyridium in the treatment of 50 cases of infections of the upper urinary tract successfully. It is an azo dye of the pyridine series and was given in doses of two tablets, 0.1 gm. (1½ gr.) each, three to four times daily.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1932, Oct., 555; ²*Practitioner*, 1932, Oct., 471; ³*Jour. Amer. Med. Assoc.* 1932, July 9, 127; ⁴*Practitioner*, 1933, April, 545; ⁵*Amer. Jour. Med. Sci.* 1932, Nov., 616; ⁶*Ibid.* Dec., 810; ⁷*Ibid.* 818; ⁸*Ibid.* 810; ⁹*Lancet*, 1933, i, 244; ¹⁰*Ibid.* 1932, ii, 221; ¹¹*Jour. of Pediat.* 1932, July, 73; ¹²*Jour. Amer. Med. Assoc.* 1932, Dec. 17, 2097; ¹³*Med. Jour. and Record*, 1932, Sept. 7, 207.

PHARMACY AND POISONS ACT, 1933.

G. E. Oates, M.D., M.R.C.P., D.P.H.

This new Act brings about a complete reconstruction of the law relating to membership of the Pharmaceutical Society, to which all registered pharmacists must now belong, and introduces a new scheme of discipline to be operated by a statutory committee. The use of the title 'chemist' or 'druggist' by retailers is safeguarded. A Poisons Board is to be constituted, which will prepare a list of 'poisons'. Those poisons in Part 1 of the list may not be sold otherwise than by or through the agency of a registered pharmacist, known as an authorized seller of poisons. The poisons in Part 2 of the list are those which are in common use for purposes other than the treatment of human ailments. Part 2 poisons may be sold not only by authorized sellers, but by unqualified persons such as grocers, seedsmen, etc. All this latter group of persons must be registered with the local authority. Generally speaking the retail sale of all the deadlier poisons is the exclusive right of registered pharmacists. Precise directions are given as to the labelling and dispensing of poisons. No obstacle is placed in the way of the dispensing of poisons or medicines containing such by medical practitioners to their patients for medical treatment, nor is there any difficulty likely to arise as regards the purchase of poisons for professional purposes by medical practitioners, or for use in hospitals, or for research purposes. No alteration is effected in the law relating to dangerous drugs.

PHLEBITIS. (See BLOOD-VESSELS, SURGERY OF.)

PILONIDAL SINUS. (See also COCCYGEAL SINUS; CYSTS AND FISTULÆ.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

This is a small opening in the skin at the level of the sacro-coccygeal joint. The condition has been referred to as 'postanal dimple' and 'postsacral dermoid'. Occasionally a tuft of hair projects from the opening. The word 'pilonidal' is derived from *pilus* meaning hair, and *nidus* meaning nest. Pyogenic infection of the sinus is not uncommon. The sinus ends blindly in a sacculated pouch. Incisions into the inflamed sinus are not curative. Excision of the tract is necessary.

M. Weinstein¹ describes the steps of the operation. After injection of a local anæsthetic, an elliptical incision is carried well beyond the sinus opening and all scars of previous operations. The skin is undermined in the manner illustrated (*Plate XLII, Fig. A*). In this way the base of the excised tissue is much larger than the superficial skin-covered portion. The dissected mass

is stripped from the periosteum of the sacrum and coccyx in the mid-line and on the sides from the gluteal fascia (*Plate XLII, Fig. B*). It is only by wide incision that prevention of recurrence can be assured. The wound is stitched with interrupted sutures, and a small drain left in the lower angle.

F. Glenn² deals with the same subject and discusses etiology. He states that the active sebaceous and sweat glands fill the tract with irritating material: once the continuity of the cutaneous lining is broken infection gains entrance and persists. The patient is seldom aware of the existence of these lesions until infection has taken place. Glenn recommends block excision and closure of the wound. Less than half the cases heal by primary union. He suggests the injection of the sinus tract with methylene blue. By this means it is possible to make a block dissection beyond the extension of the dye. Glenn summarizes his observations as follows: (1) A review of the theories of the origin of pilonidal sinus is inconclusive. (2) The infected pilonidal sinus is of clinical importance. (3) A review of 120 cases is given. (4) Incomplete excision of the entire sinus tract and its arborization results in recurrent symptoms necessitating further treatment.

REFERENCES.—¹*Ann. of Surg.* 1933, Jan., 80; ²*New Eng. Jour. Med.* 1932, Sept. 22, 544.

PITUITARY BODY, DISORDERS OF.

W. Langdon Brown, M.D., F.R.C.P.

As in several recent years, the pituitary continues to supply some of the most interesting work in the endocrinology of the year. Much of this is detailed in Cushing's fascinating Harvey Society Lecture,¹ in which he reviews the ideas of dyspituitarism expressed twenty years previously in the light of our present knowledge. This gives a vivid picture of the progress made. He gives as a personal reminiscence the fact that in 1900 Fröhlich and he were co-workers in Sherrington's laboratory at Liverpool when Babinski reported a case, unknown to them, of the syndrome which now goes by Fröhlich's name, and of which Fröhlich published a description the next year. Babinski is therefore unquestionably entitled to full priority in regard to this syndrome.

In order to maintain a clear path through the multiplicity of observations, they will be arranged under the different groups of cells in the pituitary believed to be associated with the respective findings.

Anterior Lobe.—

1. *Chromophobe Cells*.—R. Collin's² claim that these are the mother cells of both the eosinophil and basophil cells has much in its support. It would also explain remarkably well certain clinical facts. Although both Babinski and Fröhlich each described the adiposogenitalis syndrome in patients with a chromophobe adenoma (thereby impressing the profession with an unduly unfavourable view of its prognosis), it is now clearly recognized that much more benign and even temporary conditions of this kind occur. Some of them are merely instances of delayed development and show a normal pituitary fossa in the skiagram. This is quite explicable if the chromophobe cells have merely delayed their differentiation into the cells controlling growth and sexual maturity, since they have no secretory action themselves.

Some authorities regard the 'pregnancy cells' described by Erdheim and Stumme as enlarged chromophobe cells arrested in their differentiation. Normally the chromophobe cells form 52 per cent, the eosinophil 37 per cent, and the basophil only 11 per cent of the cells in the anterior pituitary, according to A. T. Rasmussen.³

Operations for chromophobe adenomas are undertaken largely to preserve vision, for the expanding lesion stretches and distorts the underlying optic

PLATE XLII

OPERATION FOR PILONIDAL SINUS

(M. WEINSTEIN)

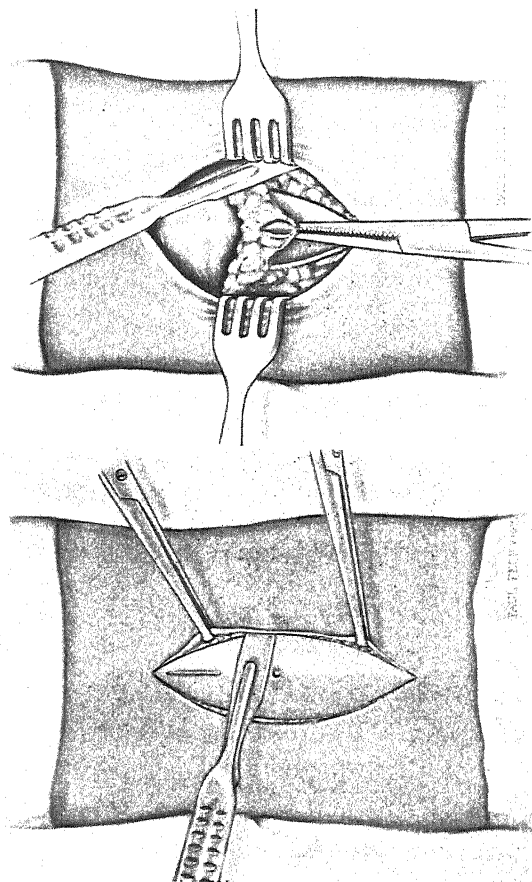


Fig. A

Fig. A.—After incising the skin, the scalpel undermines the tissues for three-quarters of an inch.

Fig. B

Fig. B.—The scalpel continues to incise in an oblique direction, and strips the tissue en masse from the sacrum and coccyx.

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chiasma, and after its removal the compressed normal elements of the gland, in fortunate instances, resume their functional activity. Cushing does not believe that the adiposogenital symptoms brought about by such tumours are due to involvement of the mid-brain, because, unlike hypophysial duct tumours, they are not accompanied by polyuria.

2. *Eosinophil Cells*.—The evidence that these cells are concerned with growth is steadily accumulating both on the positive and negative sides. The evidence as to the positive effects of eosinophil excess is well established, though Max Aron and others⁴ doubt whether this is a direct effect, and suggest that it is due to an indirect effect through a thyroid-stimulating hormone. It is unnecessary to labour well-known points concerning *gigantism*, but it is worth mentioning that Cushing⁵ describes two cases of excessive growth in boys which was arrested by irradiation of the pituitary. In this connection he makes the interesting remark that certain American College records show that whereas when he was an undergraduate forty years ago only 5.67 per cent of the freshmen were six feet or more in height, the figure is now 19.47 per cent. He speculates as to whether hereditary influences, or a growth-stimulating diet with present-day attention to vitamins, or an overactive pituitary gland is responsible for so striking a change in so short a time.

The evidence as to the negative effects of eosinophil lack is steadily increasing. P. E. Smith and E. C. MacDowell⁶ have made the surprising discovery that a defective gene leads to a congenital absence of eosinophilic elements in the pituitary of a strain of hereditarily dwarfed mice. The importance of this observation both in pathology and genetics is far-reaching.

The new clinical observations on eosinophilic lack centre round *Simmonds' disease*. In a review of twenty-four cases, the destruction of these cells was found to be due to the following causes, in order of importance: Puerperal sepsis (septic embolus), 9; syphilis, 5; cyst, 4; tuberculosis, 2; unknown, 4. (quoted by L. D. Adler⁷). As the outstanding cause is an embolus in puerperal sepsis, the disease is more frequent in, but not confined to, the female sex. Adler describes a case in a woman of 35 following a profuse post-partum hæmorrhage with an infective process. H. H. Riecker and A. C. Curtis⁸ describe three cases, two in men and one in a woman; in two of these syphilis appeared to be responsible. A number of necropsies have been reported in Germany, in which only the eosinophil cells were destroyed. It is unlikely that the basophilic cells have any relation to the syndrome, since Simmonds found that a basophilic adenoma was unable to protect against the development of the clinical picture.

The classical symptoms are premature ageing, gonadal atrophy, early and complete amenorrhœa, loss of pubic and axillary hair, atrophy of the lower jaw with loss of teeth, lowering of the basal metabolic rate, and a shrinking of the viscera which sharply contrasts with the splanchnomegaly of acromegaly. Anæmia with eosinophilia, hypotension, bradycardia, hypothermia, and achylia gastrica are also mentioned by S. Silver⁹ as points to be looked for. All these symptoms will not be found in any one case, but the presence of several of them is always suggestive. Similar symptoms in youth constitute 'progeria', a striking development of premature senility. It is possible that Lorain's type of infantilism is a less severe form of the same thing.

Treatment by **Anterior Lobe Extracts** has helped in some cases (Reye, Zondek, Lichtwitz) but by no means in all. Caution in the use of such extracts is indicated by the recent confirmations of Houssay's work, showing that they are capable of exciting glycosuria. Galta advocates **Insulin** for this as for other cachectic diseases.

3. *Basophil Cells*.—In view of the great interest aroused in Cushing's syndrome of 'pituitary basophilism', his recent classification of its signs and

symptoms is worth putting on record: (i) A rapidly acquired, peculiarly disposed, and usually painful *adiposity* (in one instance representing a 40 per cent gain in weight), confined to the face, neck, and trunk, the extremities being spared; (ii) A tendency to become *round-shouldered* (kyphotic) even to the point of measurable loss of height, associated with lumbo-spinal pains; (iii) A sexual dystrophy, shown by early *amenorrhœa* in the females and ultimate *impotence* in the males; (iv) An alteration in normal hirsuties, shown by a tendency to *hypertrichosis* of the face and trunk in all the females as well as in pre-adolescent males, and possibly the reverse in adult males; (v) A dusky or plethoric appearance of the skin with *purplish lineæ atrophicæ*; (vi) *Vascular hypertension*; (vii) A tendency to *erythræmia*; (8) *Variable backaches, abdominal pains, fatigability*, and ultimate extreme *weakness*.

Cushing¹ has recorded another case with a full account of the basophilic adenoma revealed post mortem. He suggests that some of the widespread and extraordinary effects of this comparatively small lesion are produced by the passage of its secretion, possibly modified by its passage through the posterior lobe and stalk, into the diencephalic nuclei. To this he ascribes at any rate the *adiposity* and the *hypertension*. But he also emphasizes the *bony changes*, such as kyphosis and spontaneous fractures due to decalcification, and the formation of renal calculi, which recall the features of hyperparathyroidism. Yet when the parathyroids have been examined in cases of pituitary basophilism no adenoma has been found there. Still the clinical association is a very striking one. It assumes further interest when one recalls that Paget's disease has been associated by some with the pituitary on the one hand and with generalized osteitis fibrosa on the other.

That the adrenals play some part in the syndrome is very probable. They have been found enlarged in several cases, such as Parkes Weber's, and in the past there has been a tendency to attribute *virilism* to cortical adrenal tumours without reference to the pituitary. But, as R. C. Moehlig and G. S. Bates¹⁰ insist, the adrenal cortex reflects the state of the pituitary gland; hyperplasia or hypoplasia of one is accompanied by a similar change in the other, except apparently when a temporary compensatory enlargement of the pituitary follows experimental adrenalectomy. But even this is soon followed by degenerative changes there. They conclude that some of the symptoms of primary adrenal disease are due to secondary effects on the pituitary.

It may well be asked, if the basophil cells secrete the sex hormone, why should *amenorrhœa* be a constant accompaniment of this syndrome. This would appear to be an end-result of pituitary overactivity, for, as we know from Zondek's work, repeated injections of anterior lobe substance may reduce the whole ovary to a mass of corpora lutea. The atrophic and fibrotic ovaries found in basophilism seem to be the late result of this lutein stage. A milder condition of the same thing would account for the early onset of the catamenia followed in a few years by *amenorrhœa* that is met with in a number of pituitary disorders. All this strengthens the case for those who believe that there is only one gonadotropic hormone secreted by the anterior pituitary, and that its œstrogenic and luteinizing effects merely depend on the stage of the menstrual cycle and the amount secreted. It also raises the question of the nature of the anterior pituitary-like substance found in the placenta. In view of its abundance compared with the small amount found in the pituitary at any one time, doubts have been thrown on the identity of the hormones found in these two sites. Some observers, such as Aron⁴ and Klein, believe that the hormone found in the urine of pregnant women, on which the Aschheim-Zondek test for pregnancy depends, is formed in the placenta and not by the pituitary at all. One might suggest that its relative abundance in the placenta would

maintain the supply of progestin which is so important for the retention of the products of conception in the uterus. Cushing even regards the evidence that the basophilic cells are concerned with the gonadotropic hormone as contradictory and inconclusive. There is, however, Goetsch's observation that after operative removal of the anterior lobe there is a permanent decrease in the number of Leydig's cells and a lack of spermatogenesis.

The *polycythemia* of basophilism has been elaborately studied by R. C. Mochlig and G. S. Bates.¹⁰ They are inclined to refer this, like the adiposity and hypertension, to involvement of the diencephalon. There is a type of polycythemia which differs from Vaquez's disease by the coexistence of hypertension, and Castex believes this to be a diencephalic syndrome. Schulhof noted during the epidemic of encephalitis lethargica that polycythemia was not an uncommon complication, which stimulated him in conjunction with Matthias to test the possibility of inducing polycythemia experimentally by lesions in this part of the brain, with positive results. Doll and Rothschild have reported familial polycythemia in conjunction with Huntington's chorea. Vaquez's polycythemia has been reported as a familial disease in some cases, and narcolepsy (which is associated with the pituitary by some) is not infrequently found in cases of polycythemia. They conclude that polycythemia is the result of pituitary influence (we presume they mean in conjunction with the diencephalon) on the reticulo-endothelial system. Bearing in mind the influence of the pituitary on growth, it is reasonable to assume that this important system should be stimulated to activity by its secretion. On this view, however, it is difficult to explain the mild polycythemia so frequently found in Fröhlich's syndrome.

Posterior Lobe.—The idea of the pituitary as a functioning whole was disrupted when Howell showed in 1898 that its blood-pressure-raising effect was confined to extracts of the posterior lobe. After Howell's discovery fifteen years passed before it was found that posterior lobe extracts could control diabetes insipidus, and ten years more before the relation of this to certain clusters of nerve cells in the hypothalamus was appreciated.

T. Luccherini¹¹ regards *diabetes insipidus* as due to a familial osteodystrophy probably of endocrine origin, leading to a particular conformation of the skull. C. Faelli¹² advocates its treatment by **X Rays** to the pituitary fossa, combined with the administration of powdered **Extract of the Posterior Lobe** by the nasal route. D. Scherf¹³ recommends 0.5 grm. of **Amidopyrine** by intramuscular injection, which is much cheaper than pituitrin. It will not completely replace it, however, because it leads to considerable retention of sodium chloride, and loses its effect on prolonged medication.

Of the many other functions of the vasopressin fraction of pituitrin, two points only need be alluded to. It is easy to produce hypoglycæmic shock in totally hypophysectomized dogs by insulin, but this can be prevented by a simultaneous injection of *pituitrin*, thus clearly showing again the antagonism between the posterior lobe of the *pituitary* and the cell islets of the pancreas.

It is recognized that the posterior lobe has an influence on fat metabolism. This applies also to cholesterol metabolism, in which the adrenal cortex too appears to play a part. As cholesterol disturbances are also associated with hypertension, diabetes, and nephritis, all of which may accompany pituitary basophilism, it is tempting to assume that the posterior lobe is herein concerned also. But it would be premature to attempt an account of cholesterol metabolism at present. Suffice it to say that facts are accumulating on this subject, which when the time comes to co-ordinate them, will throw a flood of light on the relationship between the reticulo-endothelial system and the endocrines.

The following general conclusions drawn by Cushing from his latest study of the subject may suitably bring this review to a close. "Out of all the present welter of discovery relating to the internal secretions, it becomes increasingly evident that the pituitary gland holds a dominating position in the endocrine series and exercises direct or indirect control over an unsuspected number of biochemical processes of utmost importance to the economy of the body. . . . The fact that adolescence normally occurs during a period of very rapid growth would suggest that [their respective hormones] at least do not work in opposition as some of the early experiments with the injection of growth extracts had suggested. . . . During the past two decades much has been learned about pituitary dysfunction from many angles; from comparative and experimental zoology most of all; from clinical pathology a great deal; something from histologic cytology; and, as yet, all too little from biochemistry, to which we pin our chief hope."

REFERENCES.—¹*Arch. of Internal Med.* 1933, April, 487; ²*La Neurocrinie hypophysaire*, 1928, Paris, Doin; ³*Amer. Jour. Pathol.* 1929, May, 263; ⁴*Presse méd.* 1932, Dec. 31, 1932; ⁵*Arch. of Internal Med.* 1933, April, 506; ⁶*Anat. Record*, 1930, 1, 85; ⁷*Jour. Med. Assoc. S. Africa*, 1933, April 8, 216; ⁸*Jour. Amer. Med. Assoc.* 1932, July 9, 110; ⁹*Arch. of Internal Med.* 1933, Feb., 175; ¹⁰*Ibid.* 207; ¹¹*Políclínico* (Sez. Med.), 1933, Jan., 53; ¹²*Ibid.* (Sez. Prat.), 1932, July 25, 1161; ¹³*Wien. Arch. f. inn. Med.* 1932, July 15, 457.

PITUITARY BODY, SURGERY OF. *Geoffrey Jefferson, M.S., F.R.C.S.*

C. H. Frazier,¹ who was, with the late Sir Percy Sargent, the leader in neurosurgery in the transfrontal approach to the pituitary body, publishes a well-illustrated account of the operation as he carries it out to-day. He had done recently 36 cases with 1 death, but also lost the 37th. Except for the illustrations there is nothing new in this paper, and, though concerned with a smaller series of cases, two other papers, one by J. E. Paterson² and the other by Adams McConnell,³ are more important. Paterson describes the histories and clinical findings in a series of 7 chiasmal lesions. It is clear that they have been most carefully worked up and skilfully handled surgically. Paterson has cause to regret that the cases were not diagnosed earlier. There come times to the neurosurgeon when it seems to him that the ophthalmologists think of everything except local tumour compression as a cause of optic atrophy, for in too many cases the atrophy is so far advanced that the most brilliant technique and the best of good fortune in the nature and relations of the tumour bring much less improvement than could have been desired.

Paterson's cases comprise four chromophobe adenomas, two meningiomas, and one hydrocephalus simulating a pituitary tumour. McConnell's cases are an important series. The first one was one of the uncommon gliomas of the optic chiasm in a boy of 13½ years. He was stunted in height, he had had a long period of polydipsia and polyuria, he had a right homonymous hemianopia, and finally a right-sided hemiparesis. Mentally he was precocious and quite free from headache. At operation the left optic nerve was found to be greatly thickened, and the glioma (for such it proved to be on section) had presumably involved the chiasm and optic tract on the left and no doubt had also interfered with the tuber. A very similar case history follows, with somewhat similar operative findings. The third case can be compared with Paterson's fifth case, and H. Cushing's⁴ famous Case 38, for it was one of internal hydrocephalus simulating a pituitary tumour. In McConnell's case, as in Cushing's, the dilated third ventricle was opened by the trans-sphenoidal route, with fatality from ascending infection. Paterson's case, opened by the transfrontal route, came to no harm. Two other cases of pituitary infantilism explored by McConnell were due, one to chiasmal arachnoiditis, the other to a Rathke pouch tumour. The five cases in children reported by McConnell form an

exceptionally interesting group. Changes in the optic nerve-head and in the fields of vision were present, whence, of course, the operations; but in two and perhaps in a third case the sella was normal radiographically apart from faint traces of calcification above it. This is important in itself, for it emphasizes the fact that exploration should be carried out on field defects alone, regardless of the X-ray appearances. In children presenting visual defects the clinician would usually suspect a Rathke pouch tumour; in adults it might still be such a lesion but is more likely to be a suprasellar meningioma. The fact that symptoms indistinguishable from those of pituitary infantilism can occur in gliomas of the optic nerves is an interesting point which here once more finds substantiation. And it is a curious fact that these gliomas are more common in children than in adults. There is something about the pathogenesis of these tumours which has not yet been discovered.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1932, Sept., 330; ²*Glasgow Med. Jour.* 1932, Sept., 149; ³*Irish Jour. Med. Sci.* 1932, July, 351; ⁴*The Pituitary Body*, 194, 1912, Philadelphia.

PLAGUE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—H. H. King and P. V. S. Iyer¹ report on the seasonal prevalence of rats and rat-fleas in parts of South India, and they confirm the low incidence of fleas in the dry hottest months and their increase with the onset of the cooler and more humid south-west monsoon season, to reach a maximum in the cold weather and during the north-east monsoon. *X. cheopis* shows by far the greatest seasonal changes, and *X. astia* is harder and less susceptible to seasonal conditions. P. V. S. Iyer² reports on a rat-flea survey in the Mysore State in Southern India, where *R. rattus wroughtoni* was common in addition to the ordinary brown-bellied variety, and *X. cheopis* was associated with the cotton trade and *X. braziliensis* with the grain trade, and some facts pointed to the latter being associated with the transmission of plague, although *X. astia* is not. The effect of the sun in disinfecting grain in bags from infected fleas has been investigated by C. G. Pandit and others,³ and they found the fleas normally tend to congregate in the peripheral layers, where the sun may kill them, but that they can and do migrate into the interior of the bags out of the reach of the action of the sun, while as they are most dangerous in the cold season sun disinfestation is of no practical value as a prophylactic measure in S. India. W. J. Webster⁴ also records a note on Indian plague rats in which he has collected useful data for their identification. The same worker⁵ records interesting notes on a study of plague in the field, including rat-catching and rat flea surveys.

TREATMENT.—B. R. R. Rao⁶ quotes the successful treatment of four cases of plague by G. W. Vincent with **Bayer 205**, and adds three cases of his own in which he gave 0.9 grm. in 10 c.c. of distilled water intravenously, with recovery.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1932, April, 1067; ²*Ibid.* 975; ³*Ibid.* 1039; ⁴*Ind. Med. Gaz.* 1933, April, 214; ⁵*Ibid.* 1932, Dec., 699; ⁶*Ibid.* Nov., 626.

PNEUMOCOCCAL PERITONITIS. (See PERITONITIS, PNEUMOCOCCAL AND STREPTOCOCCAL.)

PNEUMONIA.

J. F. Gaskell, M.A., M.D., F.R.C.P.

The year's literature is almost entirely confined to the distribution of the various types in health and disease, and to the effects of treatment by Felton's serum in cases of lobar pneumonia. R. L. Cecil¹ gives the distribution in the Bellevue Hospital, New York, for a period of ten years, 1920-30, in a total of over 4000 cases. He gets 32.2 per cent Type I, 23.0 per cent Type II, 11.1 per cent Type III, and 33.8 per cent Group IV or X. R. R. Armstrong and

R. Sleigh Johnson² in London found Type I 33 per cent, Type II 30 per cent, Type III 2 per cent, and Group IV 33 per cent. Cowan and others⁸ found in Glasgow 37.6 per cent Type I, 34.6 per cent Type II, 4.2 per cent Type III, and 23.6 per cent Group IV. Levi in Florence finds 29.5 per cent Type I, 24.3 per cent Type II, 18.9 per cent Type III, and 27.3 per cent Group IV. These figures have been quoted in order to emphasize the remarkable similarity in percentage in various parts of the world. Type III is comparatively uncommon, while Types I and II occur in 53 per cent to 70 per cent of all cases. Group IV, comprising the twenty-nine other types established by Cooper in America and Gundel in Germany, is, however, responsible for about 30 per cent of cases and is therefore by no means negligible, though M. Gundel³ in Heidelberg finds over 90 per cent to be Type I or II, Group X or IV being not found. It may therefore be taken as established that Types I and II play by far the greatest rôle in lobar pneumonia.

Bronchopneumonia and bronchitis, on the other hand, are comparatively seldom due to the first two types. Gundel³ finds 80 per cent due to Group IV, which compares closely with the already published findings in America, and also with the somewhat higher figures quoted by R. Cruickshank⁴ for Glasgow in his Milroy Lecture.

The distribution of the types in the normal population in Germany has also been summarized by M. Gundel and L. Seitz,⁵ who find 0.9 per cent Type I, 1.0 per cent Type II, 7 per cent Type III, and 91 per cent Group IV. These observers also have found that the frequency of occurrence of the various types forming Group IV is remarkably similar in both normals and patients in whom they produce disease. These figures agree closely with those previously obtained in America, and give additional support to the view that lobar pneumonia is an epidemic disease spread by carriers, while bronchopneumonia is due to organisms almost universally carried in a civilized community.

R. Cruickshank⁶ has investigated the length of time that convalescents can be carriers, and finds that virulent type pneumococci are present in the throat for some months in quite a high percentage: certain cases appear to become permanent carriers. I. M. Christie⁷ finds that 24 per cent of cases leave hospital carrying virulent pneumococci. The supervision of convalescents is thus an important problem.

J. M. Cowan and others⁸ have investigated the age distribution of lobar pneumonia, and obtain practically the same curve for Types I, II, and Group IV, with its apex in the early adult, while Type III has the same incidence at all ages. This probably accounts for the high mortality figures universally given for Type III, as it occurs relatively more often in old and feeble patients.

TREATMENT.—The results of serum treatment in America by **Felton's Serum** are described by R. L. Cecil,¹ who in carefully controlled observations has obtained a reduction of mortality in Type I from 31 to 20 per cent, with general improvement in the patients' condition, and a freeing of the blood-stream from cocci. In Type II the results are less striking, the fall only being from 45 to 40 per cent. The experience of R. R. Armstrong and R. Sleigh Johnson² is similar: the duration and height of fever is lessened and the general condition is improved, though they find little effect in very severe cases. J. M. Cowan and others agree, and report in Type I cases a fall in mortality-rate for Glasgow from 18.4 to 14.1. They have used the rapid typing methods⁹ of Armstrong and Sabin which are essential for early treatment. All authorities agree that serum is useless after the fifth day. M. Finland and W. D. Sutliff¹⁰ report better success with heroic doses of Type II serum, getting a mortality reduction of from 40 to 20 per cent in a controlled series.

J. W. Parsons and W. D. Sutliff¹¹ describe a bedside agglutination method for

regulating serum dosage, which lessens expense of treatment and gives as good results as greater uncontrolled dosage.

W. D. Sutliff with others¹² has also compared non-specific (antimeningococcal) serum with specific, and finds the former gives a fleeting temporary improvement only, the latter a permanent one. There is thus general agreement that specific serum treatment is of great value in the earlier stages of lobar pneumonia.

With regard to other methods of treatment, W. W. G. MacLachlan,¹³ investigating further treatment by **Glucose**, now reverses his opinion and considers it of no specific value. A. J. Orenstein¹⁴ finds no ameliorating effect with **Vitamin A** in native mine-workers of South Africa in a series of nearly 400 cases and 400 controls.

REFERENCES.—¹*Brit. Med. Jour.* 1932, ii, 657; ²*Ibid.* 662; ³*Zeits. f. Hyg. u. Infektionskrankheiten*, 1933, cxv, 495; ⁴*Lancet*, 1933, i, 563; ⁵*Klin. Woch.* 1933, June 17; ⁶*Lancet*, 1933, i, 680; ⁷*Ibid.* 1932, ii, 1173; ⁸*Ibid.* 8; ⁹*Glasgow Med. Jour.* 1933, June, 148; ¹⁰*Jour. Amer. Med. Assoc.* 1933, Feb. 25, 560; ¹¹*Amer. Jour. Med. Sci.* 1933, July, 52; ¹²*Arch. of Internal Med.* 1933, March, 435; ¹³*Amer. Jour. Med. Sci.* 1932, Oct., 511; ¹⁴*S. Afric. Med. Jour.* (B.M.A.), 1932, Nov. 12, 685.

PNEUMONOKONIOSIS.

J. F. Gaskell, M.A., M.D., F.R.C.P.

A comprehensive review of the present position of the subject is given by E. H. Kettle¹ in his opening address to the Pathological Section of the British Medical Association. Silica is the type cause, but asbestos also produces the condition. He holds the effect is a chemical rather than a mechanical one, and the favourable site for the tubercle bacillus thus formed can be shown experimentally in the mouse. Infective silicosis is probably a slow tuberculosis infection in highly resistant individuals, the accompanying silicosis aiding the infection. Subcutaneous injection of dust is experimentally valuable as a test. Other dusts may also be a cause, as C. Badham and H. B. Taylor² emphasize. They hold that silicates are effective and are the cause of pneumonokoniosis in coal-miners, especially anthracite workers. They describe a case in a man who had only worked in coal. The silica was in the form of silicates in the lung. A. F. Sladden³ also questions the harmlessness of silicates, and gives quantitative figures for the silica content of the lung. If over 1 per cent fibrosis is important in extent; if over 1.6 per cent fibrosis is very severe and may in itself prove fatal.

REFERENCES.—¹*Brit. Med. Jour.* 1932, Aug. 13, 281; ²*Med. Jour. of Australia*, 1933, April 29, 511; ³*Lancet*, 1933, ii, 123.

POISONING. (See TOXICOLOGY.)

POLIOMYELITIS, ACUTE.

Macdonald Critchley, M.D., F.R.C.P.

The Pre-paralytic Stage.—The successful treatment of a case of poliomyelitis obviously depends upon the recognition of the nature of the malady at the earliest possible moment. If convalescent's **Serum** is to be used, it is essential that it be administered prior to the onset of paralysis. The highly important question therefore arises of how the diagnosis is to be made before the development of obvious paralytic manifestations. At times this would appear almost impossible owing to a fulminating manner of onset; such cases, however, are fortunately rare even in this country. In Australia and the United States, where poliomyelitis is encountered in numbers far exceeding our experience in this country, the fulminating type of onset appears to be even less common. Close observation will probably reveal symptoms, bearing little or no relationship to the nervous system, appearing for a varying length of time prior to the onset of paralysis. According to J. Macnamara and F. G. Morgan,¹ in their experience of the Victoria epidemics of 1925–31, the common

mode of onset is either of the straggling or of the 'dromedary' type described by G. Draper.² In the former the illness had lasted from two to seven days; in the latter up to fourteen days, a period which includes an intermission of apparent recovery (*Fig. 77*). This latter or 'dromedary' type comprises usually a story of two or three days' indefinite illness, with fever, vomiting, drowsiness, and lassitude; then comes a period of improvement wherein the child may resume school; a second phase of illness follows, succeeded after twenty-four to forty-eight hours by paralysis. The chief symptom during this pre-paralytic phase is fever, which is rarely high except with young children during the height of the epidemic. Headache is complained of by the older children and adults. Drowsiness with irritability is noticed. Pain in the neck or between the shoulders is frequent, and pain may also be complained of in one limb. Australian observers often speak of a dengue-like state in which the child offers intense resistance to anything in the way of voluntary movement or interference. Vomiting has usually occurred once. Constipation is usual. Rarer symptoms, which nevertheless are important diagnostic points,

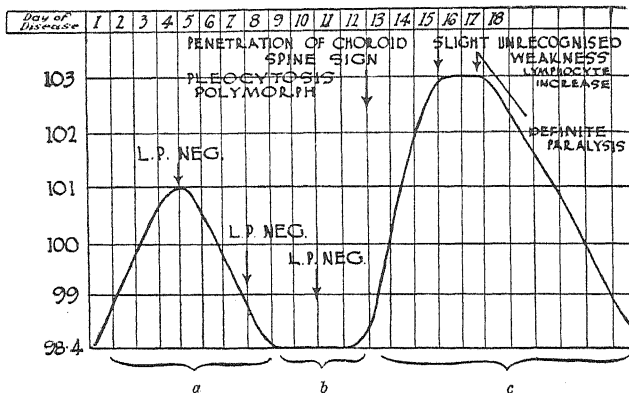


Fig. 77.—Diagram of 'dromedary' curve, after Draper. *a*, General systemic infection (5-6 days); *b*, Latent period (2 hrs.-6 days); *c*, C.N.S. period (2-6 days). (*Reproduced from the 'Medical Journal of Australia'.*)

include photophobia, local sweating, retention of urine, and tremor. Two or three special signs are of importance. Most valuable of all is the 'spine sign', or disinclination to flex the spine anteriorly on account of pain. Marked head retraction is not to be expected. Macnamara and Morgan state that the spine sign must be looked for with deliberation, and suggest the following means of elicitation. Take the child from the bed, place him in a sitting position, and gently persuade him to kiss his knee. The child will give up the attempt because it causes pain in the neck, between the shoulders, in the backs of the legs, or even along the whole extent of the spine. In the cases of infants and adults the spine sign may be tested by passive manipulation of the vertebral column. *Amos's sign*—less common in occurrence—is demonstrated by placing the child in a sitting position on a firm base. The child will assume the attitude of a tripod—using both arms to support part of the body weight and to hyperextend the spine.

Changes in the cerebrospinal fluid offer considerable assistance in the diagnosis of the pre-paralytic stage. Draper points out that no cellular increase is to be expected during the first period of malaise—the first hump of the

dromedary—but that a polymorphonuclear leucocytosis occurs at the time of the second hump. The number of lymphocytes gradually increases, however, at the expense of the polymorphs, so that by the time paralysis appears, only 5 to 10 per cent of the cells are of the latter type. Globulin appears late in the pre-paralytic stage, reaching its highest concentration when paralysis has developed. The chloride content is normal. It is highly desirable that the examination of the cerebrospinal fluid should be carried out at the bedside. Whilst this is being done the needle may be left in the theca with the stylet replaced, and, if the diagnosis of poliomyelitis is confirmed, serum can be straightway administered. In this way the minimum of delay and of discomfort is attained.

Physical Constitution and Susceptibility to Poliomyelitis.—It is always wise, when considering infective disorders, to turn at times from the toxic agent to a consideration of the host. Are there special factors, inherent or acquired, physical or psychological, which affect the degree of susceptibility of an individual towards one particular infective process? This question becomes especially apposite when the infection is one widely distributed throughout the community. G. Draper³ has directed attention towards the human factor in infections with poliomyelitis, and inquires why, if the infection be ubiquitous, should there be selection of cases. From his experience, commencing with the New York epidemic of 1916, the author believes that a special physical habitus is “a factor in the occurrence of infantile paralysis of equal importance with the virus; and as far as the development of paralysis is concerned, the constitution of the child is of greater significance than the virus.” The special physical characteristics to which Draper attaches importance are: wideness of the interpupillary space, overbite or even prognathism, short and broad hands, and wide pelvis. Fröhlisch types are not uncommon. Lunulæ are frequently missing from the nails. One of the most striking of the alleged characteristics is a Mongoloid type of palpebral fissure with epicanthic folds. Other features believed to be characteristic include: pigmented spots or moles, large widely-spaced teeth, hypertrichosis, and lymphatism. This study of Draper's, however, has not been supported by later investigations. In an anthroposcopic survey of a series of 52 children paralysed in the New York epidemic of 1931, M. I. Levine, J. B. Neal, and W. H. Park⁴ failed to discover any recognizable habitus or bodily type. The authors paid especial attention to those features indicated by Draper, and attribute their negative findings to a greater care in the selection of control cases from subjects of analogous age and racial stock.

Use of the Drinker Respirator.—J. L. Wilson⁵ suggested that a therapeutic trial of the Drinker respirator is desirable whenever there is discovered any reduction of the vital capacity from weakness of the respiratory muscles in poliomyelitis. One should not wait until cyanosis or marked dyspnoea appears. The use of the machine is not recommended in cases of bulbar paralysis (the intercostal muscles not being involved), except as an emergency, and only after every attempt has been made to free the pharynx from secretions. It was not always possible to foretell accurately the effectiveness of the respirator before a trial. In three fatal cases where the respirator had been used, there was no evidence that any harm had been done, beyond a moderate emphysema. The author records six cases of paralysis of the intercostals and of the diaphragm from poliomyelitis, where by means of the Drinker respirator pulmonary ventilation was maintained over long periods. C. Wesselhoeft and E. C. Smith⁶ believe that those unfamiliar with respiratory failure in poliomyelitis are apt to overestimate the value of the respirator in this disease by failing to differentiate the various

types of respiratory failure. In the pure spinal type there is a very good chance of survival if the machine is used promptly. In the pure bulbar type (with paralysis of the glossopharyngeal and vagus nerves) the authors believe the respirator to be of little avail. Where co-ordination with the machine is impossible or where jerky breathing or hiccup is present, the patient may be worse off with the respirator. Where co-ordination was possible, the respirator afforded great relief and comfort even in fatal cases. Of the authors' 170 cases of poliomyelitis, 30 were treated in a Drinker respirator: 13 of these 30 were admitted with respiratory failure, 6 being *in extremis*; 10 out of these 13 died. Seventeen cases developed respiratory failure after admission, and 7 of these died. It would therefore seem that when respiratory failure develops with a respirator at hand, the chances of recovery are much better.

E. Smith⁷ has given a practical account of the indications for the use of the respirator and of the management of the patient therein. The clinical picture of a child with respiratory paralysis, where the use of a respirator is indicated, is described by the author as follows: "The child lies in bed motionless; the eyes have a fearful stare; the face is dusky; the lips are cyanotic; the alae nasi dilate with every inspiration; the accessory muscles of respiration, especially the sternocleidomastoids, become visible with every inspiration; speech is difficult, quick, and whispered; the sentences are short and broken up by inspirations between words and occasionally between syllables; respirations are extremely shallow; the chest and the abdomen are practically vibrationless; the temperature steadily rises and may attain 105° F., the pulse progressively mounts; the child perspires freely; sleep is impossible and the patient may remain awake for days, growing weaker by the hour. The most important indication for placing a patient in the respirator is a diminished vital capacity, which can easily be determined by the counting test. As soon as the patient is placed within the respirator cyanosis disappears. The face registers satisfaction and contentment. The respiratory rhythm of the patient and that of the apparatus soon synchronize, and the patient falls into a refreshing sleep which may last twenty-four hours. Thereafter he becomes a nursing problem." One or two points are stressed by the author with respect to the management of the respirator: (1) Use 10 cm. of negative water pressure for children under 10 years of age; (2) Increase by 1 cm. every three or four days up to 15 cm.; (3) Adjust the speed of respiration in the apparatus to coincide with the normal respiratory rate of the patient.

Patients remain within the apparatus undisturbed, except for being turned several times daily. Attention and nursing care are carried out through the port-holes. As soon as it is possible, they are weaned from the respirator in the following manner: they are removed for one hour the first day, two hours the second, and so on, until on the eighth day they should be able to stay out of the respirator for eight hours or more without discomfort. The patient is then asked to cough. If this is possible, the child is removed from the respirator. Unless cyanosis, excessive perspiration, or somnolence develop, the child may then be transferred to the convalescent ward. Should the patient be removed from the respirator before he is able to cough, there is a danger of atelectasis with bronchopneumonia.

For the benefit of practitioners in this country, it may be mentioned that a Drinker respirator may be obtained from Sir Robert H. Davis, 187, Westminster Bridge Road, S.E.1. It is illustrated in *Plate XXXVIII*, p. 326.

REFERENCES.—¹*Lancet*, 1932, i, 469, 527; ²*Poliomyelitis*, 1927, Philadelphia; ³*Amer. Jour. Med. Sci.* 1932, July, 111; ⁴*Jour. Amer. Med. Assoc.* 1933, c, 160; ⁵*Amer. Jour. Dis. Child.* 1932, xliii, 1433; ⁶*New Eng. Jour. Med.* 1932, ccvii, 559; ⁷*Jour. Amer. Med. Assoc.* 1933, May 27, 1666.

POLYCYTHÆMIA VERA.*Stanley Davidson, M.D., F.R.C.P.E.*

H. Z. Giffin and E. V. Allen¹ claim that from their experience of the treatment of 37 patients suffering from polycythemia vera with **Phenylhydrazine** over a period of four to six years, they are able to show conclusively the value of this form of treatment. The drug is given in capsules in 0.1-grm. doses two or three times daily until 3 to 4 gm. have been administered. An active preparation must be obtained and it should be put fresh into capsules each week as required. The drug is cumulative in its action and hamolysis continues for ten days after the initial treatment has stopped; hence the need for caution and repeated blood examination. The authors publish case reports which indicate that, after the initial course of treatment has been completed, the disease may be controlled by the administration of a very small dose of the drug weekly, e.g., 0.1 to 0.4 gm. Some of the patients after two to four years' treatment were able to dispense with the drug entirely and maintain a normal blood-level. Contra-indications for phenylhydrazine treatment are persons with advanced arteriosclerosis or visceral lesions, and persons over 60 years of age.

C. E. Forkner, T. F. McN. Scott, and S. C. Wu² claim that marked improvement in the clinical and hematological manifestations occur in patients suffering from polycythemia vera within twenty to fifty days following the administration of solutions of **Potassium Arsenite** (Fowler's solution). They consider that this is a safe and reliable method for the palliative treatment of the disease. The dose recommended is 3 to 4 min. three times a day. This is continued for two days and the daily dose is then increased by 3 min. Subsequent increments are made slowly until symptoms of intoxication, such as anorexia and diarrhea, appear. It is essential that the drug be pushed despite mild toxic symptoms, and then gradually withdrawn when its action has taken place. They claim that they are able to give between 12 and 20 min. of Fowler's solution three times a day.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1933, Jan., 1; ²*Arch. of Internal Med.* 1933, April, 616.

PREGNANCY. (*See also* MATERNAL MORTALITY AND MORBIDITY.)**PREGNANCY, THE BERCOVITZ TEST FOR.***Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.*

An interesting pupillary reaction which results from instilling into the eye of a pregnant patient a few drops of her own blood has been described by Z. Bercovitz,¹ who regards it as a valuable diagnostic procedure. At first the author used serum only, but later employed citrated whole blood. Pregnancy is indicated either by dilatation or contraction of the pupil, or an alternation of the two, when contrasted with the other eye, which serves as a control. Bercovitz found that the blood from a pregnant patient is capable of producing a positive reaction in the eyes of non-pregnant individuals and such animals as rabbits and cats. He stresses the necessity of even illumination of the two eyes by a soft yellow light and the importance of observing the equal size of both pupils before the test is commenced. In a series of 72 observations on 68 pregnant women, 80 per cent showed a definite pupillary reaction; 4 per cent were doubtful, and the remainder were negative. On the other hand, amongst 72 non-pregnant women 100 per cent gave a negative result.

The test is extremely simple, and it is interesting to note whether Bercovitz's claims can be substantiated by the results of other investigators. A. J. Gordon and S. W. Emmer² obtained a positive reaction in 64 per cent of 90 pregnant women. M. White and A. O. Severance,³ however, obtained a

positive reaction in but 19 of 58 pregnant patients, and of 15 non-pregnant controls 3 responded positively!

In a recent series of 107 cases of proved pregnancy recorded by A. G. King,⁴ a positive result was obtained in 68 per cent, a doubtful response in 10 per cent, and a negative result in 21 per cent. Further, the reaction is not constant in the same woman at different examinations—a very important and interesting observation. In 108 tests performed on non-pregnant individuals, including males, King obtained 4 false positive results and 11 doubtful reactions. He rightly concludes, therefore, that the test, using the technique of Bercovitz, is not sufficiently reliable to be of value in the diagnosis of doubtful cases of pregnancy. The unreliability may be accounted for by various factors. In the first place the reaction is relatively transitory, and, as already stated, is not always constant in the same individual. Furthermore, the matter of illumination is of such importance that the experimental error may be very large. This is increased by the fact that no means are available of making precise measurements, and therefore the personal equation must be relied upon. King makes the interesting observation that the test is not adapted to individuals with dark eyes, particularly negroes.

Bercovitz has suggested that the pupillary reaction may be due to the presence in the blood of an epinephrin-like substance, an opinion based upon the fact that when epinephrin (1-1000 solution) was dropped into the eyes of the same series of pregnant women investigated for the blood reaction, 76 per cent gave positive results. This explanation of the Bercovitz reaction is regarded as untenable by King, who points out that the typical epinephrin reaction is dilatation of the pupil, and that epinephrin ordinarily affects the pupil only in the presence of a lesion of the cervical sympathetic system and in some cases of glaucoma. He considers that the pupillary reactions during pregnancy, although not sufficiently reliable for diagnostic purposes, merit further investigation in the hope that the true explanation will throw additional light on the physiology of pregnancy.

REFERENCES.—¹*Amer. Jour. Obst. and Gynecol.* 1930, xix, 767, *Trans. Sect. Obst. Gynecol. and Abd. Surg., Amer. Med. Assoc.* 1930, 77; ²*Amer. Jour. Obst. and Gynecol.* 1931, xxi, 723; ³*Jour. Amer. Med. Assoc.* 1931, xevii, 1275; ⁴*Amer. Jour. Obst. and Gynecol.* 1933, xxv, 99.

PREMATURE INFANTS.

Reginald Miller, M.D., F.R.C.P.

The premature infant—that is, one born after the twenty-eighth and before the fortieth week of intra-uterine life—presents many problems in its management and care. R. C. Jewesbury¹ discusses these in the light of his very considerable experience in such matters. He regards the distinguishing physiological characteristics of the premature child on which its management must be based as three in number: (1) The undeveloped state of the nervous system, with inability to regulate and maintain the body heat: in which connection it is to be remembered that the relative surface area of the body is larger in the normal baby, and that there is an absence of subcutaneous fat and the intake of food is necessarily low. (2) The undeveloped digestion, making it difficult for the premature infant to deal with any food except the mother's milk. (3) The low state of vitality, with consequent lack of resistance to infection. These handicaps must be met by supplying: (1) Warmth; (2) Sufficient fluid and food of a suitable kind; and (3) Protection from infection.

Warmth.—The author is, as are many other authorities, against the use of incubators on the ground that there is not sufficient ventilation to provide the child with cool air for breathing, and prefers a lined basket cradle heated with three hot bottles. The room, although it must be well ventilated and free

from draughts, should be kept warm, even up to 70° in the case of a weakly baby. The skin should be cleaned every second or third day with warm olive oil, but no ordinary bath should be given to an infant until it reaches a weight of 5 lb. and then only every other day and if it is vigorous. Special care must be taken to keep up the temperature of the room at any time that the baby is exposed.

Food.—The child requires the daily ingestion of fluid amounting to from one-sixth to one-fifth of its body-weight. Feeds should be given every 3 hours, and in very frail infants every 2½ or even 2 hours. **Breast Milk** is supremely important and in some cases vitally necessary, and if it cannot be supplied by the mother it should be obtained from a foster mother. The breast milk should be diluted at first, usually for two weeks. Boiled water or 2·5 per cent **Glucose** solution may be used as the diluent; and for the first week two parts of this to one of breast milk, and in the second week equal parts, may be used. In most cases, though not in all, it is possible to get the infant on to undiluted breast milk at the end of a fortnight. The feeds may have to be given by a pipette or even a tube. When it becomes necessary to adopt artificial feeding Jewesbury has a preference for peptonized milk prepared by forty-five minutes' peptonization and boiled. He advises the following formula :—

Peptonized milk	..	3 oz.
Whey	..	3 oz.
Lime water	..	½ oz.
Lactose	..	2 level teaspoonfuls
Water	..	To make up to 10 oz.

The fat may be gradually increased by the addition of a small quantity of 50 per cent **Cod-liver Oil** emulsion. Unsweetened condensed milk, suitably modified, is usually well tolerated and is easy to use. J. A. Tobey² is in favour of the use of condensed milk in the feeding of premature infants, and advises the employment of the sweetened brands.

Where there is no possibility of employing breast milk, Jewesbury advises nothing but boiled water for the first twenty-four hours; then 2·5 per cent glucose solution, gradually adding whey to it, until the fourth day, when the peptonized milk may be begun as in the following table, drawn up for use in the case of a baby weighing about 4 lb. at birth :—

AGE OF BABY	MODIFIED MILK	GLUCOSE SOLUTION, 2½ PER CENT	NEW MILK (boiled for 10 minutes)	DAILY TOTAL OF MILK AND SUGAR MIXTURE	50 PER CENT COD-LIVER OIL EMULSION	
					In ounces	In level spoonfuls
4th day	.. 1½	6	—	7½		
5th day	.. 3	6	—	9		
6th day	.. 4	6	—	10		
7th day	.. 6	6	—	12	2¼	¼ teaspoonful
End of—						
2nd week	.. 9	5	—	14	1½	½ teaspoonful
3rd week	.. 12	4	—	16	1¾	¾ teaspoonful
4th week	.. 14½	2	½	17	1¾	1 teaspoonful
5th week	.. 17	—	1	18	2¼	1½ teaspoonfuls
6th week	.. 18	—	1½	19½	2¼	1½ teaspoonfuls
7th week	.. 19	—	1½	20½	2¾	2 teaspoonfuls or 1 dessertspoonful
8th week	.. 20	—	2	22	2¾	2½ teaspoonfuls
9th week	.. 21	—	2	23	2¾	2½ teaspoonfuls
10th week	.. 22	—	2½	24½	3	3 teaspoonfuls
11th week	.. 22½	—	2½	25	3¼	3½ teaspoonfuls
12th week	.. 23	—	2½	25½	3¼	1 tablespoonful

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9th week	.. 21	—	2	23	2½	2½ teaspoonfuls
10th week	.. 22	—	2½	24½	3	3 teaspoonfuls
11th week	.. 22½	—	2½	25	3½	3½ teaspoonfuls
12th week	.. 23	—	2½	25½	4	1 tablespoonful

PROGNOSIS.—Premature babies are not necessarily weaklings, provided that they are born without congenital disease or defect, and that they receive skilled attention from the first. If properly managed, most of them reach the average normal standard within twelve or eighteen months, and do not suffer from any lasting handicap in life. Jewesbury states that the smallest baby he has had charge of was 14 oz. at birth, and grew up to be a normal child. The mortality-rate in premature babies under 5 lb. at birth is about 23 per cent in the first ten days of life, as judged by the figures from a lying-in ward. In a series of 192 premature babies of 5 lb. or under at birth admitted to Cromwell House, Highgate, the death-rate was 12 per cent. [Presumably cases unable to survive the first week or so of life would not figure in such a series.—R. M.]

REFERENCES.—¹*Practitioner*, 1933, ii, 9; ²*Med. Jour. and Record*, 1933, April, 339.

Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.

The care of the premature infant has acquired additional importance during recent years, partly no doubt as a result of the fashion of performing induction of labour in the interests of the mother, and partly from appreciation of the proved fact that premature children, if they survive, become equally sound individuals both physically and mentally as mature infants. During the past year incredibly small infants have survived in some clinics, an eloquent testimonial to the nursing services and the determination to save even the most unpromising lives. In a useful communication on the management of premature infants by F. J. Hector¹ the author concludes that 95 per cent of the credit for the survival of a small premature child is due to its nurse. The two most important points in the attainment of success are **Temperature** regulation and **Feeding**. The temperature of the foetus in utero is 0.5° higher than that of the mother, and according to Hector the deaths of many premature infants certified as due to 'congenital debility' are really caused by the effects of cold sustained immediately after delivery. It is highly important that the temperature should not be allowed to fall even for a short time, and for this reason the child must be received at birth into a warm blanket or gamgee tissue. To maintain the temperature subsequently hot-water bottles at 160° or, better still, an electric blanket is advocated. The cost of the latter is about 30s., and it can be used off any voltage. The blanket is arched between the enveloping gamgee tissue and the ordinary covering blankets. A constant temperature of 160° is easily maintained by this means, a method which has been in constant use at Queen Charlotte's Hospital during the past two years.

If the child's weight is below 4 lb., the rectal temperature should be taken two-hourly by day and night for the first fortnight. Above 4 lb. weight the temperature need only be taken at four-hourly intervals, but it must be maintained between 97° and 99°.

Below a birth weight of 4 lb. there must be no attempt at bathing or even oiling, and Hector is of opinion that, whatever the birth weight, no premature infant should be oiled unless the rectal temperature is within normal limits. The author also criticizes the tendency to over-clothing, and the piling on of many blankets is to be avoided. Such a procedure interferes with the circulation of warm air and may actually weigh down the chest.

Adequate and proper feeding is the next great essential to success. It should be commenced six hours after birth by means of small sips of water or saline containing 5 per cent **Glucose**. The amount and frequency of feeds is highly important, and the author expresses the view that gross over-feeding is a common mistake. Indeed, he is of opinion that many premature infants are killed by too much food! In the case of infants under 3½ lb. weight he advises ½ drachm two-hourly. Children over 3½ lb. may receive 1-drachm

feeds two-hourly day and night. The rate of increase of the feeds should be checked by watching the effects upon the infant, and may vary from $\frac{1}{2}$ drachm daily for children below $3\frac{1}{2}$ lb. to 1 drachm daily over this weight. Suitable feeds for a baby of $3\frac{3}{4}$ lb. are given by Hector as follows :—

Day 1	1	drachm	two	hourly	12	feeds	
" 2	$1\frac{1}{2}$	"	"	"	12	"	
" 3	2	"	"	"	12	"	
" 4	2	"	"	"	12	"	
" 5	$2\frac{1}{2}$	"	"	"	12	"	
" 6	3	"	"	"	10	"	(omit 2 night feeds)
" 7	3	"	"	"	10	"	" " " "

If the weight is over $3\frac{1}{2}$ lb., ten feeds daily may be given for two or three weeks, then eight feeds daily. Cyanosis and refusal of feeds are danger signs, and the best indications for an increase in the amount of food are given by the weight curve and the manner in which the infant receives the feeds.

The best possible food is breast milk, and the smaller and more premature the child the more important this becomes. In maternity hospitals the problem of providing breast milk is, of course, easily solved, a very good reason for the institutional management of all premature labours.

Failing breast milk, artificial feeding must be instituted. At Queen Charlotte's Hospital the following modified milk mixture is in use :—

Whole milk	..	..	..	10 oz.
Fat whey	..	..	..	10 oz.
Lactose	..	..	..	1 oz.
Cream (50 per cent fat)	..	..	..	$\frac{1}{2}$ oz.

The milk is peptonized for three hours, but at the end of three weeks this is reduced by twenty minutes on alternate days. The feed is given at a temperature of 100° , and if the infant is unable to suck, use must be made of a nasal catheter or pipette. On no account must the child be taken out of its cot for purposes of feeding, and the greatest care must be exercised to avoid infection. The nurse in charge should wear a mask, and during the first four weeks it is advisable to exclude, as far as possible, all visitors.

Hector points out that the premature child is extremely susceptible to infection, and in Germany successful attempts have been made to supply the antibodies which it lacks by the injection of whole blood or serum. The blood from any healthy donor may be used apparently without previous grouping : 2 c.c. of blood are given on the first day, 3 c.c. on the third day, and 5 c.c. on the fifth day. The latter is continued on alternate days until ten injections have been administered.

REFERENCE.—¹*Bristol Med.-Chir. Jour.* 1932, 301.

PRE-OPERATIVE AND POST-OPERATIVE TREATMENT. (See also ABDOMINAL SURGERY, MISCELLANEOUS; GALL-BLADDER, SURGERY OF.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

Pre-operative Procedures.—The subject has been dealt with frequently in the MEDICAL ANNUAL. There is a general recognition amongst surgeons that the art of operating has reached its zenith and that the actual operation in the hands of an experienced surgeon is becoming one of secondary importance. Methods of examination are so complete and perfect that there should be no place in modern surgery for the term 'exploratory incision'. Thus by thorough examination and due consideration before the operation, it is possible to determine beforehand the exact operative measures required in an individual case. To find at operation something unsuspected may at times be inevitable, but it is a minor disaster. The patient suffers from the lengthening of an

incision or the sudden change in any previously planned operation. The requisite instruments are not at hand, and the performance becomes the makeshift of a handy-man instead of a work of premeditated art. References to authorities and exchange of views with surgical friends should be part of the pre-operative effort in a difficult case. A single quick examination, the admission of the patient the night before for operation the following day, leads to errors from which there is no retreat.

G. Sacks¹ states that, in cases where severe operations are contemplated on elderly people, not only are the heart, blood-pressure, and lungs carefully examined, but also electrocardiograms are made whenever it is thought necessary. The renal function is estimated. Basal metabolic and cardiac studies are made in goitre cases. Blood-sugar and repeated urine examinations are indispensable in diabetic surgery. He discredits, like most other surgeons, the administration of purgatives before operation. No purgatives and no enemata are given in rectal cases except when malignant. At operation a speculum is inserted, a light gauze pack is pushed well up and left *in situ*, and the bowel below is swabbed out and cleaned.

Patients as a rule should be allowed to eat within two to three hours of operation. There is no need to add the acidosis of starvation to the burden which the patient already carries. Nothing favours the onset of paralytic ileus more readily than indiscriminate and violent purgatives. A paralysed segment of bowel should be treated by rest. For the first two days after an operation for peritonitis the indication is for **Morphia** and **Radiant Heat** rather than for purgatives. In a personal communication Dr. Charles Mayo advised the reviewer to try the effect of rectal injections of **Warm Milk** and **Molasses** in such cases. Half a pint of warm milk, containing two or three tablespoonsful of treacle, is injected per rectum every three or four hours. This injection is of a sedative rather than an irritating kind, but none the less promotes peristalsis, and flatus is passed in many cases.

In cases of shock it has been shown that the capillary circulation is impaired. The desired object is to improve the capillary circulation, and probably the best way is to increase the blood volume. **Blood Transfusion** gives the most lasting effect. If there is any œdema of the back, extremities, or lungs, the continuous use of intravenous saline is likely to water-log the tissues. Every case of intestinal obstruction should have **Hypertonic Saline** administered during the danger period before and after operation. In cerebral cases hypertonic saline or **Glucose Solutions** will reduce intracranial pressure. One of the disadvantages associated with intravenous saline is the occurrence of rigors. They are caused by the toxic products of bacteria and not by bacteria themselves. Sacks is convinced that we drain abdominal cases too frequently. He mentions the case of perforative appendix with generalized peritonitis. The appendix is removed, the peritoneum closed, hypertonic salines with glucose are forced subcutaneously, rectally, and intravenously. Nothing is given by the mouth. The stomach is washed out frequently. **Anti-gas-gangrene Serum** is injected intra-muscularly (10 c.c. of the concentrated preparation). No attempt is made at purgation until the patient has passed flatus. He only drains the late cases of perforated peptic ulcers. He suggests that the administration of **Carbon Dioxide** two or three times in the twenty-four hours for the first two days following operation on the upper abdomen should be a routine practice. Nothing relieves post-operative nausea so well as **Gastric Lavage** and the administration of **Glucose**. Good surgery, he concludes, implies unlimited care of the patient before, during, and after the operation.

[There are some points in Sacks' communication which attract special attention. Rigors after blood transfusions and the intravenous administration of

glucose should seldom occur if proper attention is paid to the underlying cause, viz., the absorption of bacteriological products. The reviewer suggests **Merck's Dextrose** as being chemically pure. The solution is made with freshly distilled water; it is filtered twice and the flask is put in the autoclave. It is sterilized in the autoclave for fifteen minutes under 15 lb. pressure. In the present state of our knowledge it is best to have some definite routine which has proved to be safe and reliable by experience. Glucose in sealed glass tubes is not always chemically pure. To eliminate errors, filtering the solution twice before use is a sound plan. Too short or too long a period in the autoclave may produce changes in the solution which in some unaccountable fashion are responsible for reactions. Reactions do not follow when glucose is prepared in the manner suggested. If it is slowly administered, the exact temperature is of no importance.—W. I. de C. W.]

E. R. Flint² gives a good account of the now all-important question of pre-operative procedures.

Rest in Bed for thirty-six hours should be regarded as a minimum before all abdominal operations. Mental rest is, perhaps, as important as physical. Sound sleep before operation is of real therapeutic value. He discusses **Avertin** and thinks it fairly reliable, but it should be freshly prepared. Sometimes patients become rather wild under its influence and it causes some fall in blood-pressure. He recommends **Pernocton** (1 c.c. per 27½ lb. of body-weight), but the dose seems rather difficult to regulate. At the same time, he advocates **Nembutal**, two capsules 1½ gr. in each, the night before operation. [The reviewer does not use nembutal. It appears, with other drugs of the same group, to have contributed to the mortality in the records of published cases.—W. I. de C. W.]

Attention is drawn to the disconcerting fact that in such an institution as the Leeds General Infirmary in three years there were 50 deaths following operations performed for gastric and duodenal ulcers and malignant disease of the stomach (acute perforations are omitted). In none of these cases was suppuration present at operation, yet in 20 per cent the predominant post-mortem finding was peritonitis. The explanation is probably to be found in the poor resistance that ill-nourished tissues put up against even minimal infection. Once again it is urged that starvation and purgation must be avoided before operation and that small intestines must be handled as little as possible. [The reviewer has found more and more that, when the appendix is to be removed in conjunction with gall-bladder or stomach operations, it is better to employ two incisions instead of one. The appendix can be removed through a small incision far out in the region of the right iliac fossa. By employing the additional incision, handling of the small intestine is to a large extent avoided.—W. I. de C. W.]

Flint believes that flatulent distension is relieved and not induced by **Morphia**.

In the bad risk cases, *dehydration* is one of the principal factors to be considered. In health the body holds a fairly constant amount of water. The normal intake is about three litres per day. The corresponding output is accounted for by the urine and insensible loss from the lungs and skin. On the other hand, output may be excessive on account of vomiting or diarrhoea. Operation and its attendant circumstances will inevitably cause some further dehydration. The far-reaching effects of dehydration are best seen in acute high intestinal obstruction. The loss of water and salts drains the blood, which becomes too concentrated to maintain peripheral circulation, and kidney function is depressed almost to the point of cessation.

In discussing *anaesthesia* it is pointed out that ether produces hypoglycaemia ;

in a liver already somewhat depleted of its glycogen this additional attack may be serious. Flint is convinced that the safety of the patients lies more with improvements in pre-operative measures than in actual operative technique. All experienced surgeons are similarly convinced.

Practical *biochemical problems* are admirably dealt with in this paper. Although pre-operative treatment is not discussed in detail, Flint's deductions make it clear that patients should be in hospital for at least a few days before a major operation; that the grade of risk should be estimated by thorough examination, including renal function tests; that the patient should be provided with a large reserve of carbohydrates, alkalis, and fluids; and that the anaesthetic question is of considerable importance.

[The practice of the reviewer for many years has been to give the patients as much fluids, carbohydrates (glucose, barley sugar, etc.), and alkalis as they can comfortably take, to avoid purgation and starvation, and, incidentally, to wash out the stomach for a few days before every gastric operation. In a bad risk case gas oxygen combined with morphia and local infiltration of the wound area with 1-1000 percaïne solution is the routine employed. The barbiturates are avoided. Local anaesthesia is used in every case except where there is local sepsis or malignant disease. When a spinal anaesthetic is employed chest complications are as numerous as with inhalation anaesthesia. Ephedrine is best given half an hour before the spinal anaesthetic is introduced. It has no effect immediately afterwards. If there is collapse after a spinal anaesthetic, the best remedy is blood transfusion. No drug will contract the dilated capillaries until the effects of the spinal anaesthetic have disappeared.—W. I. de C. W.]

Post-operative Pulmonary Complications.—A. L. Brown and M. W. Debenham³ found that post-operative pulmonary complications, especially atelectasis, appear to be greater following spinal anaesthesia than after inhalation anaesthesia. They summarize their investigations as follows: (1) Statistics showing the relative incidence of post-operative pulmonary complications following inhalation anaesthesia and subarachnoid anaesthesia are presented. (2) In this series of 812 cases, post-operative pulmonary complications were 4.29 times more frequent after subarachnoid anaesthesia than after inhalation anaesthesia in spite of the fact that more 'bad risk' patients were operated on under inhalation anaesthesia. (3) The adverse ratio for subarachnoid anaesthesia is found regardless of the region of the body operated on or the type of operation performed. (4) The more closely the operative procedure approaches the diaphragm, the greater is the incidence of post-operative pulmonary complications.

Post-operative Pneumonia.—H. C. R. Darling⁴ calls attention to the serious menace to patients from pulmonary trouble after a successful operation. It has been stated that approximately 1 patient in every 50 operated upon develops a lung complication and that there is 1 death amongst every 185 cases. So-called post-operative pneumonia is quite unlike true lobar pneumonia. Lobar pneumonia is distinctly uncommon, being almost limited to post-operative pneumonia occurring in epidemics. When such an epidemic breaks out in a ward, no abdominal operation should be performed until every patient in whom such a complication has occurred has left the hospital.

Prophylactic treatment consists in adequate **Oral Hygiene** before and immediately after operation. It is surprising what little attention is given to the preparation of the patient's mouth before operation as compared with the infinite precautions taken to protect him from septic invasion in every other direction. Many of the cases of so-called post-operative pneumonia are inflammation from the pneumococcus which is identical with the pneumococcus isolated from the mouth. Frequent mouth-washes before operation

and, of course, dental preparation are essential. Amongst other preventive measures suggested is the use of local anaesthetic to infiltrate the abdominal wall. [The reviewer has adopted this régime as a routine for twenty-five years, and recommends a solution of 1-1000 **Percaine with Adrenalin** as a means of preventing severe post-operative pain.—W. I. de C. W.]

Chevalier Jackson calls the cough reflex 'the watch dog of the lungs', and warns operators against the free use of opium or its derivatives, lest the expulsive cough, so essential for clearing the bronchial tree of secretion, should be abolished. Free **Breathing Exercises** should be encouraged in the wards as soon after the operation as possible, and the inhalation of 5 per cent **Carbon Dioxide in Oxygen** at the end of the operation and afterwards in the wards ensures hyperventilation and deep breathing. A plug of sputum will often be expelled by the simple expedient of rolling the patient backwards and forwards on his sound side.

(See also BRONCHOSCOPY.)

Post-operative Saphenous Thrombophlebitis.—H. B. Stone⁵ urges that more attention should be given to ligation of the saphenous vein in these cases. He discusses several cases in which operation for hernia, operation for gall-bladder, etc., were followed by thrombophlebitis of a branch of the saphenous vein which was responsible for the development of pulmonary embolism. The point is that embolism rarely, but none the less definitely, may convert a relatively simple situation into a dangerous or fatal one. The ease and safety with which embolism may be guarded against when the original thrombophlebitis is limited to the saphenous system of veins is a strong reason for active intervention. Under local anaesthesia it is an extremely simple matter to ligate the saphenous vein in the thigh an inch or two below its entrance into the femoral. The writer has been content to doubly ligate the vein with thin silk without dividing it, and occasionally where the area of involved vein was small, he dissected out the involved segment. One interesting case is mentioned—a woman late in pregnancy developed an extensive saphenous thrombosis. In this instance the saphenous vein was ligated as usual and then the whole thrombosed segment of vein was dissected out. The question is asked, "Why put people to bed for weeks on a passive or expectant form of treatment when there is always the possibility of a clot getting loose. Why not perform the simple operation of ligation under local anaesthesia and eliminate the chance of embolism?"

REFERENCES.—¹*Jour. Med. Assoc. S. Africa*, 1932, Sept. 24, 585; ²*Lancet*, 1933, i, 1163; ³*Jour. Amer. Med. Assoc.* 1932, July 16, 209; ⁴*Med. Jour. of Australia*, 1932, July 23, 104; ⁵*Ann. of Surg.* 1932, Aug., 683.

PROSTATE, SURGERY OF. (See also CATHETERIZATION OF THE URETHRA.)

The Prostate as a Hidden Source of Infection.—P. S. Pelouze¹ says that in the male the outstanding focal triad is teeth, tonsils, and prostate gland. The prostate as a source of infection is often overlooked. It may take several microscopical examinations of the prostatic fluid before one can state that this organ is not infected. Normally leucocytes are absent. The infection is by no means usually gonococcal. The organisms generally found are staphylococci and streptococci. Sometimes there are no symptoms referable to the prostate. At others there is a slight urethral discharge, mucopurulent filaments in a limpid urine, sexual phenomena (emissions and erections), and above all frequency of micturition (Hogge²).

De la P. y Pineda³ comes to the conclusion that prostatic infection is frequently secondary to another focus. Treatment consists in removal of the

primary focus, prostatic massage, dilatation, and instillations of **Silver Preparations** into the posterior urethra. **Autogenous Vaccines** and intravenous injections of **Neosalvarsan** or **Sodium Salicylate** are sometimes efficacious in stubborn cases.

Prostatic Calculi.—Prostatic calculi can arise in one of three ways: (1) Enlargement and calcification of corpora amylacea; (2) Deposition of calcareous salts in infected prostatic crypts; (3) Urinary calculi impacted in the prostate.

SYMPTOMS.—A considerable proportion, probably the majority, give rise to no symptoms. Occasionally acute inflammation with the formation of an abscess results. Prostatic calculi often cause a chronic fibrosing prostatitis, ultimately terminating in urinary obstruction. When riddled with small stones the prostate generally feels hard and irregular; indeed, the erroneous diagnosis of carcinoma of the prostate has been made upon such findings. Prostatic calculi usually cast an excellent X-ray shadow. When the question of the existence of such calculi arises an oblique radiograph of the pelvis will be decisive. Only those cases giving rise to symptoms require active treatment. (C. J. Marshall.⁴)

E. W. Riches and E. G. Muir⁵ consider **Transurethral Partial Prostatectomy** is the operation of choice in cases of calculous prostatitis.

Prostatic Abscess.—In 200 consecutive cases of gonorrhœa treated at the Whitechapel Clinic, 12 (6 per cent) developed prostatic abscess (H. Lett⁶).

Benign Enlargement of the Prostate.—F. Legueu⁷ states that there is no such thing as prostatic hypertrophy, but only a prostatic adenoma developing in connection with peri-urethral glands, having nothing to do with the prostate proper.

Giant Prostates.—C. C. Holman⁸ records the case of a prostate weighing 11 oz. removed successfully from a man of 85. Referring to this case, A. G. Clark⁹ draws attention to a prostate exhibited at a German surgical meeting in 1931, where the prostate weighed 8 lb. The tumour extended nearly to the umbilicus and was larger than a man's head.

Transurethral Partial Prostatectomy.—Transurethral partial prostatectomy was discussed rather fully in the *MEDICAL ANNUAL* last year (p. 367). K. Walker¹⁰ states that the method is particularly applicable to cases of 'prostatic bar'. The chief danger is sepsis, and this is minimized when an instrument is used such as McCarthy's electrotome, which resects the portion of the gland which it coagulates instead of leaving necrosed tissues to putrefy. T. J. Kirwin¹¹ also expresses restrained judgement on this controversial subject. He advocates the transurethral operation principally in cases of prostatic bar, slight lateral-lobe hypertrophy, middle-lobe hypertrophy, carcinoma of the prostate, and congenital urethral valves. If transurethral resection is regarded as a minor surgical procedure, disaster is likely to follow. C. J. Thompson¹² advises the method particularly for men over 70 and those at an earlier age in poor general health. C. H. Bumpus¹³ writes that transurethral surgery has increased greatly in the Mayo Clinic during 1932, and that 276 patients received transurethral resection during that year.

F. J. McCarthy¹⁴ maintains that it is only necessary to free the encumbered prostatic urethra to an extent which will remodel its lumen. T. M. Davis¹⁵ is not in accord with this view. He insists that at least two-thirds of the total gland should be removed.

H. G. Bugbee¹⁶ says that in such a fascinating field as transurethral resection it is not difficult to become enthusiastic to the point of losing judgement. All too easily one can assume a frame of mind which looks back on prostatectomy as a procedure surrounded by serious complications and a high mortality rate.

Prostatectomy is a serious operation because the subjects on which one works are so poor. Bugbee details a list of serious complications which he has seen following transurethral prostatectomy. J. D. Gaulbach¹⁷ says that the number of complications following transurethral resection, such as recurrence, serious hæmorrhage, sepsis, and burns of the bladder, has led him to choose transurethral implantation of radon seeds in preference to diathermy. He is eminently satisfied with his results.

The Harris Operation.—The Harris operation, which is, briefly, prostatectomy, reconstitution of the prostatic bed with sutures, and primary closure of the bladder leaving in an indwelling urethral catheter, probably has not received the attention in this country which it deserves. Harry Harris,¹⁸ of Sydney, Australia, has had a series of 84 cases of his operation without a single death. C. A. Wells¹⁹ discusses the advantages of the method and records cases where the patient was up, urinating normally, within a fortnight. R. K. Lee Brown²⁰ finds the principal disadvantage of the method is the post-operative after-care required of the nursing staff. Any neglectful or unskillful treatment on their part may cause much more trouble in the primary closure than in the open operation.

Carcinoma of the Prostate.—H. P. Winsbury-White²¹ says that carcinoma occurs as an adenoma-carcinoma or as a scirrhous. It may arise in an apparently normal gland or in one affected by simple enlargement. Malignant changes can occur in any part of the prostate and in the prostatic capsule remaining after enucleation. J. F. McCarthy and S. E. Kramer²² draw attention to the failure of these cases to be diagnosed early. The classical signs—nodulation, induration, and fixation of the prostate—are too often missed through want of a rectal examination.

R. Caulk and S. Boon-It²³ compare carcinoma of the prostate with carcinoma of the female breast. Both are diseases of the latter part of middle life, and spread early by way of the lymphatic system. They are alike also in their predilection to skeletal metastasis. Emphasis is laid on the necessity for early and careful attention to the inflammatory lesions of the organ, for it is believed that in the same way as chronic interstitial mastitis predisposes to mammary carcinoma, so chronic prostatitis too often terminates in the development of malignancy. P. Cave²⁴ gives a detailed study of the X-ray appearances of the bone metastases. Usually the secondaries show areas of rarefaction in the affected bones, but occasionally there is an increase in density.

What Proportion of Prostatic Enlargements are Malignant?—The question of the proportion of enlarged prostates which macroscopically appear benign and histologically are malignant assumes great importance in view of the increased popularity of transurethral partial prostatectomy. Formerly, carcinoma of the prostate was considered to be a rare disease. Statistics from various sources show that 15 to 25 per cent of cases of prostatic enlargement are carcinomatous (J. D. Barney²⁵). Of 618 consecutive prostatic tumours examined by Dosset²⁶ at the Necker Hospital, 123 were found to be carcinomatous. H. P. Winsbury-White states that a careful microscopical examination of enucleated prostates has revealed cancer in 20 per cent.

TREATMENT.—

Radical Treatment.—H. P. Winsbury-White stresses the importance of a complete radiological examination to eliminate bone metastasis before radical treatment is undertaken. H. H. Young²⁷ shows that the prostate is enclosed within three fascial coverings, and that carcinoma rarely penetrates them all until late. He advocates an extensive operation, which includes removal of the prostate with its capsule, the neck of the bladder, the seminal vesicles, and vasa deferentia in one block. He is able to present 40 cases: 29 of these

patients were operated on more than seven years previously. Most other authors bewail the lateness with which cases of carcinoma of the prostate reach the surgeon: 30 per cent have already bone metastases (McCarthy and Kramer). The ilio pelvic and the abdominal glands were involved in 34 out of 36 cases studied by Dosset. Too often the surgical removal of carcinoma of the prostate is futile.

Palliative Treatment.—For the prevention and treatment of urinary obstruction by a malignant prostate, transurethral tunnelization is ideal. Radium and X-rays may retard progress of the disease, but they are in no sense curative (McCarthy and Kramer and H. P. Winsbury-White).

For the pain of the bone metastases deep **X-ray Therapy** is sometimes valuable. In 40 such cases E. T. Leddy and C. Gianturco²⁸ obtained definite but incomplete relief of pain in 21 instances. For the relief of the local pain in inoperable prostatic cancer M. Kirschner²⁹ advocates **Chordotomy** (laminectomy and section of the spino-thalamic tracts). He advises chordotomy as high as the 4th dorsal vertebra. Even though the pain is only unilateral, the division should be carried out on both sides of the cord. If the patient is in poor condition, a 'permanent' spinal anaesthesia is preferable, using **Alcohol**.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1932, Aug., 254; ²*Monde méd.* 1933, April, 601; ³*Experimental and Clinical Study*, 1932, Madrid; ⁴*Practitioner*, 1933, Jan., 55; ⁵*Brit. Jour. Surg.* 1933, Jan., 366; ⁶*Clinical Jour.* 1932, Dec., 14; ⁷*Monde méd.* 1932, Nov. 15, 982; ⁸*Brit. Med. Jour.* 1933, i, 366; ⁹*Quoting Zentrab. f. Chir.* 1931, Nov. 17, 1071; ¹⁰*Brit. Med. Jour.* 1933, i, 355; ¹¹*Amer. Jour. Surg.* 1933, Jan., 1; ¹²*Proc. Staff Meeting Mayo Clin.* 1932, Sept. 27, 513; ¹³*Ibid.* 1933, April, 204; ¹⁴*Jour. Amer. Med. Assoc.* 1932, Nov. 26, 1828; ¹⁵*Ibid.*; ¹⁶*Ibid.* Dec. 3, 1928; ¹⁷*Med. Jour. and Record*, 1932, Oct. 5, 295; ¹⁸*Brit. Jour. Urol.* 1929, 285; ¹⁹*Lancet*, 1932, ii, 1268; ²⁰*Austral. and N.Z. Jour. Surg.* 1933, April, 339; ²¹*Practitioner*, 1933, 217; ²²*Amer. Jour. Surg.* 1933, Feb., 209; ²³*Amer. Jour. Cancer*, 1932, Sept., 1024; ²⁴*Brit. Jour. Radiol.* 1932, Oct., 745; ²⁵*Jour. Surg.* 1933, Feb., 69; ²⁶*New Eng. Jour. Med.* 1932, Aug. 18, 313; ²⁷*Quoted Amer. Jour. Surg.* 1933, Feb., 209; ²⁸*Surg. Gynecol. and Obst.* 1933, Feb., 447; ²⁹*Amer. Jour. Roentgenol.* 1933, May, 667; ³⁰*Zeits. f. urol. Chir.* 1933, Jan., 191.

PSORIASIS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

ETIOLOGY.—In view of the fact that it has been suggested that disturbances in the intestinal flora may be responsible for attacks of psoriasis, J. C. Torrey and H. J. Schwartz¹ have made a number of investigations into this question. They report the results of the examination of the intestinal flora in 30 cases of psoriasis and of blood cultures in 16 cases. They find that the types of bacteria vegetating in the intestines in these cases do not differ essentially either qualitatively or quantitatively from what might be encountered in a similar series of non-psoriatic persons who are not sufferers from gastro-intestinal disabilities. They find no evidence, so far as can be judged from the bacterial types encountered, that any unusual bacterial toxin of a soluble nature or toxic product from bacterial decomposition is formed in the intestinal tract of sufferers from this disease. Blood cultures were negative in 11 out of 16 cases. In 5 cases with positive cultures, bacteria apparently of intestinal or buccal origin were isolated, but these were diverse in type and evidently merely casual invaders of the blood-stream. Intradermal inoculations were made with autogenous antigens prepared with a culture isolated from the stools or the blood in 10 cases. There was no evidence of sensitization of an allergic nature to the test bacteria in these cases of psoriasis.

TREATMENT.—R. M. Bohnstedt² describes the treatment of some cases of psoriasis by **Colloidal Manganese**. The treatment is based on the theory that in the psoriasis papule there is an alteration in the oxidative function of the epithelial cells and that indirect oxidation can be effected by the administration of a metallic activator. Van Kerckhoff considered that manganese in colloidal form has the power of considerably increasing the oxidative function of the

psoriatic cell. The author has used colloidal manganese in two forms: as a preparation for intravenous use, called '**Psorimangan**', put up by the firm of Weil of Frankfurt. The dose given is 1 c.c. to commence with and 2 c.c. afterwards. The author has tried higher doses but has found no improvement in the results. If any uncomfortable symptoms develop, he does not give a higher dose than 1 c.c. Doses are given twice weekly up to ten to twenty injections. More than twenty injections are generally unnecessary. Among his patients one developed a severe reaction (cyanosis, dyspnoea, vomiting, shivering, and high fever), but this patient had a severe generalized exudative psoriasis. Some patients developed slight headache or a slight rise of temperature, but no severe reactions. The other method was by intramuscular injection of finely dispersed '**Psorimangan**'. This can be given in doses of 1 to 1.5 c.c. without producing local pain, but larger doses are painful. The injections are given twice weekly.

The author reports the results in 21 cases treated by the intravenous method and 10 by the intramuscular method; of these, the one case mentioned above, in which a severe reaction occurred, cleared up after the one injection: this the author considers due to 'shock therapy'. Of the remainder, 6 cases (5 intravenous and 1 intramuscular) remained refractory to treatment; 8 cases (7 intravenous and 1 intramuscular) were cured; and 7 cases (4 intravenous and 3 intramuscular) were only slightly improved. Both these groups had, in addition, mild local applications. In the remaining 9 cases (4 intravenous and 5 intramuscular) **Cignolin** or **Chrysarobin** therapy was also employed, and of these in only 1 case (intramuscular) was the course of the disease materially shortened.

H. S. Campbell and K. Frost³ report further on a method of treating psoriasis by the intramuscular injection of an alcoholic suspension of **Autogenous Psoriasis Scales**, which they first introduced in 1930. The treatment is based on the theory "that psoriasis is due to a non-inoculable, non-culturable, ultra-microscopic organism." The authors admit that this theory has been submitted and rejected many times, but they consider it is the most feasible of the various theories of the etiology of the disease that have been put forward. The emulsion is prepared by scraping away scales from patches which have not recently been locally treated, after cleansing them with alcohol. The scales are then placed in a mortar and pounded to a powder, about 0.2 gm. of scales being used; 25 c.c. of pure grain alcohol is added, and after standing for twenty-four hours the preparation is injected into the gluteal muscles, commencing with 0.5 c.c. Doses are given twice weekly. After three doses 1.5 c.c. is given, and this is continued to the end of the course; no advantage is obtained by giving larger doses. Some injections are painful, but any marked inflammatory reaction is rare if the dose does not exceed 1.5 c.c. Fifty cases were treated by the authors: in 10 cases patients ceased treatment; in 30 generalized eruptions cure was obtained in 10, improvement in 19, and aggravation in 1. In none of the 10 cases in which there were only a few lesions did healing result, but in 2 improvement occurred.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1932, July, 27; ²*Münch. med. Woch.* 1932, July 15, 1150; ³*Arch. of Dermatol. and Syph.* 1932, Sept., 435.

PSYCHOTHERAPY.

H. Devine, M.D., F.R.C.P.

Psychotherapy in Schizophrenia.—P. Shilder¹ observes that while schizophrenia can be regarded as an organic disease, we must not maintain that an organic disease cannot be provoked by psychical causes and that it cannot be influenced by psychical methods of treatment. Psycho-analytic investigations so far have failed to show what the fixating events and facts in schizophrenia are, but it is justifiable to ask about the general problems concerned

in the psychical treatment of organic conditions. Since a sharp borderline between organic and psychogenic must not be postulated, it is clear that as long as we have no reliable somatic therapy we should use our psychotherapeutic procedures. In some cases psycho-analytic approach may help, but where this is not possible we can help the patient to adapt. **Occupation Therapy** will, for instance, be of importance here. It will be possible also to remove factors which provoke excitement and therefore pull the individual back from reality. It is possible that even these measures will favourably influence the process of disease. Psychotherapy is obligatory in every schizophrenic patient. Schilder maintains that we can do much for the schizophrenic patient, but it cannot be decided yet whether schizophrenia is curable or whether we can help the sufferer to a better adaption to reality and to his life problems.

From the psycho-analytical standpoint the recognized difficulty of psycho-analytic treatment of schizophrenia is that in this disease the libido is withdrawn from objects to the ego; hence the childish ideas of megalomania, the infantile habits, the revival of auto-erotic forms of gratification, the recklessness in regard to cultural requirements, and the utter disregard and carelessness of the external world. This adhesiveness of the libido to the ego is termed *narcissism*. According to recent work from the psycho-analytic standpoint on schizophrenia, it would appear that the view is held that in the narcissistic psychoses the hereditary factor has to be taken into account. Thus P. Clark² suggests that in these conditions the hereditary endowment may include something defective in the ego's capacity for meeting or adapting to its environment; and, again, that there may be an inherited tendency on the part of the instincts to cathect the ego rather than outer objects. Within the instinctual development itself there may be lacking the urge to pass beyond the limits of narcissism to attain higher levels of gratification.

In spite of the difficulties, efforts have been made to apply the psycho-analytical technique in a modified form in schizophrenic patients. Thus G. Zilboorg³ has recently given an analysis of a case of schizophrenia. The analysis took place in about 450 interviews of one hour each. The writer observes that a preliminary period of "reality testing" is required before the analytic situation is attacked, and adds that it is doubtful whether any type other than the paranoid is amenable to analysis. No claim for cure is made.

After presenting four psycho-analytic studies of schizophrenia, A. A. Brill⁴ concludes that only those acute schizophrenics who cannot be kept at home should be sent to a sanatorium, and they should only stay there until the acute process subsides. Though that is only possible in a few cases, he feels that the ideal hospital treatment should consist of well-trained physicians who would study the patients while in the sanatorium even while they are in the inaccessible stage. Following the acute state, the same physician should treat them psychologically and continue to watch and guide them after they are discharged from the hospital. Such patients require guidance for a long time, perhaps for the rest of their lives.

Psychotherapeutic Methods in Psychiatric Hospitals.—F. Alexander,⁵ writing from the psycho-analytic standpoint, observes that the tendency to make the environment in modern mental hospitals as agreeable as possible is of value, as it makes the patient realize that there is some place that he can fill successfully, and so he is less likely to utilize fantastic hallucinatory satisfactions. He also comments on the principle of selecting staff with personality traits similar to those of schizophrenic patients, as identification comes about more easily with persons of similar type. In his view identification with the analyst or with someone else is important.

W. C. Menninger⁶ gives an interesting outline of the psychological methods of treatment which he has organized in a large mental hospital in his endeavour to put into practice the principles of dynamic psychiatry. A patient, the writer observes, comes to the hospital not with symptoms, but with problems. It is not sufficient that he be made physically comfortable; rest and freedom from responsibility alone will not satisfy his psychological need. His problems must be studied intensively, interpreted, and a solution attempted. This solution can be worked out in two ways: (1) By the creation of an environment in which the patient can function with more ease than in that from which he has come; and (2) By the establishment of a series of scientifically controlled friendships in the course of prescribed therapy.

1. *Environment*.—From the moment the patient enters the hospital an attempt is made to provide for him an environment suited to his needs and wishes—i.e., to *him*, rather than adapt him to the institution. The hospital, with all its necessary prohibitions and restrictions, paradoxically, must also permit an opportunity for freedom and an outlet for expression. It must protect the patient from the world and often from himself, and simultaneously create an atmosphere of confidence and reassurance. Above all, it must be a highly organized, efficient institution, and at the same time conceal the organized efficiency and the impersonal institutional air. Individual differentiation in the manner of the patient's reception and management in the hospital is a large factor in his subsequent improvement. Such individualization is possible only through the recognition of the emotional plight of each patient. It is not aimed, however, to maintain the patient in an individualized environment indefinitely. The process of recovery requires that he gradually win his way back until he is able to leave the artificially created atmosphere and enter again into the world of reality.

2. *Scientifically Controlled Friendship*.—Menninger considers the emotional response, which he describes as "scientifically controlled friendship", to be the chief factor in the process of recovery. The hospital building and all the materialistic armamentarium are of little importance as compared with the personality relationships that exist between the patients and the members of the staff. Every doctor is familiar with the part that confidence plays in the treatment of his patients, and he is aware also of the influence, adverse or favourable, of relatives and friends on his patients. Menninger has made it his aim to elaborate this familiar principle and has greatly reinforced it by making it a matter of study and practice for not only the doctors and nurses but every employee of the hospital. Briefly, it may be said that the fundamental aim is to permeate the institution with a spirit of co-operation and sympathetic insight into the aims of the hospital and the methods of carrying them out.

The Daily Schedule.—To be the most effective the principle of "controlled friendship" must be carried out in a systematic way. To ensure this, a schedule of assigned activities is written out and given to each patient at the beginning of each week. This not only informs the patient that he is being given individual consideration, but also maintains a continued plan of therapeutic attack. Pre-eminently, however, it gives opportunity for successive personal contacts through the pre-arranged scheduling of the various therapeutic tools of occupational therapy, recreation, physical therapy, reading, music, and other creative efforts, rest, psychotherapy, study groups, etc. The friendly relationships which the patient forms in the course of his schedule transforms this daily plan from a progression from one unrelated unit of treatment to another into a continuous process of treatment facilitated by various occupations.

This whole plan of treatment is a continuous form of psychotherapy. It depends initially on the physicians' understanding of the patient's conflicts gained through frequent personal conferences. These interviews are not the casual contacts established in ward rounds, but are scheduled appointments. The value of friendliness, kindness, personal attention, and encouragement are recognized intuitively by everyone, but their scientific application as therapeutic tools is surprisingly rare. In these experiments and investigations Menninger has attempted to carry this principle into all departments and to animate the patients' work with its purposive stimulus.

Grading of Mental Patients in Mental Hospitals as a Therapeutic Measure.—M. E. Erickson and R. G. Hoskins⁷ describe a plan adopted in the Research Service of the Worcester State Hospital, consisting in a scheme of grading based chiefly on behaviour. It is formulated in terms comprehensible to the patients, rather than appealing to the scientific sense of the psychiatrist. An explanatory statement of the scheme is posted conspicuously in the wards. It consists of a series of paragraphs, and each is displayed as a large poster. Each poster carries the line, "Patients are sent home only from Grade B". In each ward is kept posted, also, a roster of all patients on the service, classified by grades. Each week a list of promotions and demotions is posted.

THIS WAY OUT

All patients in the RESEARCH WARDS are graded according to their progress. As they improve they are promoted. They are sent home ONLY FROM GRADE B. If you want to go home, improve your grade.

GRADE A—AT HOME

Able to act like normal people
Able and willing to work
Able to get along with family and friends

GRADE B—GOING HOME

Getting well enough to go home
Working well
Reliable on parole
New interests and new ideas
Old ideas controlled or understood
Rebuilding mental strength to stay well
Patients are sent home only from Grade B

GRADE C—ON PAROLE

Working and playing well
Getting new ideas and interests
Making the best of everything
Co-operating well and obeying rules
Patients are sent home only from Grade B

GRADE D

FIRST CLASS ON THE WARD

Keeping neat and tidy
Working well and playing well
Learning to take things as they come
Beginning to understand old ideas
Learning to co-operate in everything
Patients are sent home only from Grade B

GRADE E

SECOND CLASS ON THE WARD

Working and playing poorly
Lazy and shiftless
Too proud of own ideas
Not very co-operative
Careless of clothing
Patients are sent home only from Grade B

GRADE F

THIRD CLASS ON THE WARD

Mute, resistive
Silent or too talkative
Excitable and disturbed
Not co-operating
Not working or playing
Patients are sent home only from Grade B

From the first, the patients manifested a marked interest in the posters. A census revealed that at least 80 per cent were giving them their personal attention. Some patients were elated over their classification; others were disappointed and argumentative, though only one or two of a hundred showed any definite antagonism.

The writers feel that the plan described can be directly related to the underlying principles of psychiatry. The project is definitely planned to meet the patients at their childhood levels, to evoke childhood memories, and utilize earlier conditioning. Again, the simplicity of the plan broadens its appeal both to the patient of lower grade mentality and to the patient whose interest cannot be aroused in anything requiring much mental effort because of his pre-occupation with his phantasy life. Particularly, the principle of graduated achievement is theoretically sound. To many patients in the lower grades the feat of stepping at once into the highest grade seems impossible of achievement. The task of improving their status by a single grade, however, appears much less hopeless, and they are accordingly more inclined to make the necessary effort. The writers express the view that this method is widely applicable to state hospital practice, and yields excellent therapeutic results for the effort expended.

Auto-suggestion and Hypnosis.—Suggestion and hypnosis as therapeutic methods appear to have been in a large measure superseded by the various forms of analysis. It may therefore be helpful to remind ourselves that the older methods may be usefully applied in many forms of illness both physical and mental. In a lengthy paper H. V. Exner⁸ states that during the last two and a half years he has treated a few hundred cases by hypnosis and suggestion. He has found that constipation yields very readily to this treatment. Six cases of asthma have all greatly benefited, three of the cases having had no attacks for over twelve months. One case simulating hay fever finally cleared up under hypnotic treatment. Insomnia, depression, hysteria, all yielded to this treatment, whilst operation cases, if taken in hand previously, do ever so much better than those not treated. Morphia is hardly ever required, whilst the calmness with which patients get on to the operating table is most gratifying to the patient, doctor, and nursing staff. The writer has performed dental extractions under hypnosis, the patients, mostly children, not feeling a thing. The tooth socket hardly bleeds, and healing is definitely accelerated, even in bad cases of pyorrhoea. The alimentary tract proves to be exceptionally partial to hypnosis and auto-suggestion, and constipation, vomiting, loss of appetite, and indigestion all yield readily to this treatment.

The writer has found that with the co-operation of the patient all cases of illness benefit, sleep and rest are assured, confidence is restored, and the fighting powers of the body are accordingly increased. Stammering can be cured by this treatment, fear and nervousness can be completely and permanently eliminated, bad habits broken—e.g., smoking, drinking, etc.—and good habits inculcated, whilst to get rid of an inferiority complex no surer method than hypnosis and auto-suggestion could be employed. The writer believes that auto-suggestion and hypnotism are two of the most potent weapons in the physician's hands, not only in preventing but also in curing disease and alleviating the sufferings of mankind, and are a great factor in teaching the patient self-help.

Psychological Factors in Somatic Disease.—Of recent years it has increasingly been suggested that organic diseases may be disturbances related to the emotional life. This view has been especially developed by the Adlerian school of Individual Psychology. J. C. Young⁹ observes that to repress a state of fear or rage, however admirable from the social point of view, is a physiological sin. It not only leads to neurosis in the commonly accepted meaning of the term, but may lead to physiological chaos and anarchy. The gist of Freud's teaching is that neurosis is sex in the wrong place; and of Adler's that it is "power striving" not "usefully" expressed—that is, in

the wrong place. Young submits that some forms at least of organic disease are the outcome of affective charges, whether of fear or rage, chronically or repeatedly diverted along wrong channels under the influence of repression. Control of affect is a totally different matter from repression of affect. To control implies a certain awareness. Repression is automatic, unconscious. With control, affect can be worked off in a physiologically healthy manner at the time, or be suitably canalized at leisure. Repressed affects, which are charges of energy not being abreacted, have an anarchical effect. The poet Blake says "Desire unacted breeds pestilence". Thus an organ or system may be persistently over-stimulated by reason of an affect of chronically repressed fear or rage. If we grant that memory is a general function of organized matter, then it is reasonable to suppose that the memory of over-stimulation or persistent stimulation in an organ or system may be manifested in a continued over-functioning of that organ or system, even after the specific affective source of that over-stimulation has ceased to operate. In other words, an organ or system may maintain a habit of reaction long after that reaction has ceased to be useful, and has even become detrimental to the organism as a whole.

Young gives a number of case histories which support his thesis of an emotional origin in physiological disorders. One of his patients developed *vittiligo*, a disease characterized by a piebald condition of the skin. Stellwagon describes this condition as a neurosis, thus implying that it has its origin in a disturbance of the affective life. There appears to be a general consensus of opinion that the disease has a generic relationship with Addison's disease. It also sometimes occurs as a sequel of exophthalmic goitre. It is common knowledge that human hair has been known to turn white in a single night as the result of some unusually severe emotional strain. It is perhaps not so generally recognized that the bleaching of the skin characteristic of vitiligo may also occur summarily after the experience of severe emotional trauma. In support of this view Young quotes a case described by W. Pierangeli, the gist of which is as follows: A young Neapolitan lady was doing the washing-up one evening when a political riot occurred. There was revolver shooting, and some people were wounded. During the following week the lady was in a state of acute nervous agitation. Ten days later, when taking a bath, the patient was astonished to find a small white bleached patch of skin on the outer side of the right leg. This case illustrates the fact that vitiligo, like bleaching of the hair, can supervene with dramatic suddenness following an experience of acute fear. Young observes that it is probable that all the gland changes which occurred slowly in his own case under the influence of *chronic* fear, and finally resulted in the clinical picture of vitiligo, were speeded up in the case of the Neapolitan girl under the influence of *acute* fear.

Besides skin affections, Young is of the opinion that there are quite a number of diseases in the causation of which the affective life takes an important part. He considers gastric (or duodenal) ulcer is one of these. Three cases are cited in which the onset of symptoms was associated with intense crises in the emotional life. The writer is convinced that skilled treatment on individual psychological lines would have averted operation in two of the three. The third got his divorce a fortnight before his prospective operation. His symptoms at once began to subside. He refused operation, and is now perfectly well. Short-circuiting operations, necessary and successful as they often are, should more and more be regarded as indications of lack of preventive medicine directed to the affective life of the patient. They will be necessary, Young contends, so long as conflicts in the affective

life are allowed, as it were, to entrench themselves on what may be called the organic level.

F. Alexander,¹⁰ writing from the psycho-analytical standpoint, discusses the influence of psychic factors in relation to physiological disease. He points out that functional disturbances, though essentially identical with psychopathological processes of expressing emotions such as laughter and weeping, are nevertheless distinct from them by three characters: In the case of a psychogenetic disturbance of an organ the emotion which seeks expression is repressed; the psychogenic disturbance is an incomplete expression of a psychic tension; and, finally, the symptom is not able to relieve the psychic tension in the same way as normal psychometer reflexes do. The repressed tendency, excluded from consciousness and thus from normal expression, sustains a steady tension which is the cause of the chronic dysfunction. Every psychic tendency seeks an adequate bodily expression. Normally this is through the conscious ego, probably localized anatomically and physiologically in the cortex. If this passage is blocked, an unusual relief comparable to a short-circuit takes place; this is the hysterical dysfunction of the organs. The investigation of the psychic constellation of the patient is important even in cases of certain organic disturbances, since chronic functional disturbances may lead to real organic disease.

For illustration the etiological problem of peptic ulcer is reviewed. In several cases Alexander has established the psychic origin of functional stomach troubles that preceded clinically diagnosed peptic ulcers, and in one analysed case it was possible to reconstruct the psychological factors that had been in the background of the stomach symptoms for many years. The repressed wish for a revival of the infantile relation to the mother maintains a permanent tension which tends to influence stomach functions. The associated wish to be fed, independent of hunger, serves as an unconscious wish to be loved. Hence the stomach is exposed to a chronic and specific stimulus. In this way a chronic hypersecretion or hypermotility may arise. The writer considers that it is established that many organic cases develop because there is an originating chronic psychic stimulus in the form of a repressed unconscious psychic tendency; that this leads to functional disturbance of an organ; and that a last phase manifests itself in organic morphological changes. The choice of the organ that serves for the expression of unconscious tendencies depends on the specific nature of the tendency. Just as passive claims to be loved have an intimate relation to the alimentary tract, so do fear and anxiety seem to have a close connection with the circulatory system, whereas the emotions of spite, stubbornness, or rejection of the environment may frequently, if they are repressed, find expression in the disturbance of the sphincter-function of the anus. Alexander considers that psychotherapy has mainly a prophylactic value. It consists in giving the patient the possibility of relieving psychic tendencies in the normal way by making conscious those repressed tendencies which, on account of repression, could not be expressed normally and had to find unusual pathological expression.

REFERENCES.—¹*Amer. Jour. Psychiat.* 1932, xi, 1181; ²*Med. Jour. and Record*, 1933, Jan. 18, 59; ³*Arch. of Neurol. and Psychiat.*, 1930, xxiv, 335; ⁴*Amer. Jour. Psychiat.*, 1929, ix, 519; ⁵*Arch. of Neurol. and Psychiat.* 1931, xxvi, 815; ⁶*Jour. Amer. Med. Assoc.* 1932, Aug. 13, 538; ⁷*Amer. Jour. Psychiat.* 1931, xi, 103; ⁸*Jour. Med. Assoc. S. Africa*, 1933, March 25, 171; ⁹*Individual Psychology Publications*, 1932, April, No. 4, 40; ¹⁰*Jour. Amer. Med. Assoc.* 1933, c, 469.

PULMONARY ABSCESS. (See LUNG, ABSCESS OF.)

PULMONARY TUBERCULOSIS. (See TUBERCULOSIS, PULMONARY.)

PURPURA HÆMORRHAGICA. (*See also SPLEEN, SURGERY OF.*)*Stanley Davidson, M.D., F.R.C.P.E.*

In an excellent paper H. W. Jones and L. Tocantins¹ discuss the treatment of purpura hæmorrhagica. These authors fully realize that spontaneous remissions are frequent; hence the difficulty in deciding upon the value of any special treatment given. The removal of infectious processes, particularly in guarding against relapse, is stressed. Capillary hyperpermeability is believed to be an essential for the production of the hæmorrhagic phenomenon. Great attention should be paid to the bleeding time as the chief indication for the value of treatment. Small intravenous **Transfusions** of 300 c.c. of blood frequently administered, is the best way of controlling the bleeding time. **Ligation of the Splenic Artery**, or **Splenectomy**, should be reserved only for cases which have failed to respond to repeated transfusions.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1933, Jan. 14. 83.

PYELOCYSTITIS. (*See also PYURIA IN CHILDREN, KETOGENIC DIET IN; URINARY ANTISEPTICS.*)*Ivor J. Davies, M.D., F.R.C.P.*

Ketogenic Diet Treatment.—A. L. Clark¹ (Rochester, Minn.) showed in more than 50 cases that hyperacidity and ketonuria will inhibit growth of organisms in cases of various bacillary infections of the urinary tract, so that cultures of urine become free of growth, and symptoms are relieved. Tables and methods of calculation of the ketogenic diet used at the Mayo Clinic were reproduced in his paper.

SPECIMEN KETOGENIC DIET (Band, Dunlop, and Dick).

Carbohydrate: 30 grm. Protein: 54 grm. Fat: 251 grm.

Total calories: 2595.

Total glucose: 86. Fatty acid: 251. G:FA = 1:3.

Breakfast.—45 grm. bacon (uncooked weight). Use all bacon fat.

60 grm. tomato, or mushroom.

Tea or black coffee with 45 grm. single cream.

One soy bun.

Dinner.—45 grm. lean meat.

90 grm. cauliflower, or sprouts, or cabbage, or spinach.

Orange cream (orange juice, 60 grm.; double cream, 45 grm.; gelatine, 2 grm.).

Tea.—60 grm. salad made from lettuce, tomato, cress, cucumber.

One soy bun with butter from ration.

Tea with 45 grm. single cream.

Supper.—One egg scrambled with 30 grm. double cream and butter.

90 grm. rhubarb or vegetable, as at dinner.

One soy bun with butter from ration.

Tea or black coffee with 45 grm. single cream.

Daily Ration.—Olive oil, 15 grm. t.i.d.

Butter, 97.5 grm. t.i.d.

D. Band, D. M. Dunlop, and I. L. Dick² (Edinburgh) present a valuable study of chronic pyelocystitis with particular reference to the ketogenic diet treatment. About a year and a half ago the attention of Clark and Helmholtz in the Mayo Clinic was called to the fact that the urine of patients undergoing the ketogenic treatment of epilepsy could be allowed to stand for a very long time without becoming putrid. Possibly also they recalled the old-fashioned dictum that it is possible to catheterize a diabetic without fear of infection. They explained the phenomenon by supposing either that organisms did not grow successfully in a urine whose acidity has been greatly increased by its high content of organic acid, or that some natural urinary antiseptic might

exist among the excreted ketone bodies. Acting on this supposition, they subjected a number of their patients with urinary infections to ketogenic diets, and have since published a considerable number of strikingly successful results.

Following this discovery the first-named observers arranged to try out this new treatment in a series of cases in the 'intractable' group which had formed 16.9 per cent of their cases of chronic pyelocystitis. The diet used contains a minimum quantity of carbohydrate, a small quantity of protein—since glucose can be formed from protein—and a maximum quantity of fat, so that the glucose/fatty-acid ratio is about 1 : 3. Such a diet is usually capable of producing a marked ketonuria in the adult, though some require the daily intake of carbohydrate to be reduced as low as 20 or even 15 gm. before a satisfactory ketonuria is attained. When it is remembered that a normal diet contains about 300 gm. of carbohydrate it will readily be understood that this is rather a difficult type of diet for the patient to tolerate. On the other hand, in children a ketonuria may be achieved by a much less drastic curtailment of carbohydrate.

All the cases studied had had urinary trouble of some kind or another for years, and had previously been subjected to hospital treatment with unsuccessful results. To sum up their detailed case-reports: Out of 11 cases of very chronic and intractable urinary infection, 5 were apparently cured by the treatment, and one was considerably benefited. In one case of trigonitis with marked frequency the symptoms entirely subsided. Three patients were refractory to the diet for various reasons, and the treatment, which had not so far proved successful, had to be discontinued. In 2 cases the diet was given a fair trial and proved quite ineffective, but in one of these the patient was suffering from a tuberculous infection. It is possible that the results would have been better if the dietetic treatment had been combined with the administration of an acid-producing salt like ammonium nitrate, as is recommended by Clark.

The objects of the bacteriological researches of this report were: (1) To measure the bactericidal or bacteriostatic properties of urine passed by patients in a state of ketosis; (2) To determine whether these properties are due to changes caused by diet in the reaction of the urine or to some unknown anti-septic substance. The experiments showed: (1) Ketonuria had a bacteriostatic effect—at least for the type of organism used; (2) This effect was not entirely due to increase in the acidity of the urine; (3) It was still *sub judice* whether a certain degree of acidity is essential for the production of this bacteriostatic effect; (4) Any evidence as to the nature of the active substance was so far only of a negative kind.

C. M. Wilson³ (London) reports a successful personal experience of the treatment of coli bacilluria by a ketogenic diet, and also remarkable results in 20 patients in whom the duration of the infection with the colon bacillus varied from seven months to eighteen years. He described how the diet was made comparatively inoffensive to the patients, who had to be reconciled to 240 gm. of fat in the day, and to the almost total deprivation of carbohydrates. Protein was given in the normal amount.

A. T. Fuller⁴ (London) has investigated the nature of the bactericidal agent in the ketogenic diet. He concludes from his experiments that the principal factor inhibiting the growth of bacteria in the urine from patients receiving ketogenic diet is *L*- β -oxybutyric acid. The activity of this substance increases in proportion to the acidity of the urine.

REFERENCES.—¹*Lancet*, 1932, ii, 511; ²*Practitioner*, 1933, May, 65, and *Proc. Roy. Soc. Med.* 1933, Jan., 217; ³*Lancet*, 1932, ii, 960; ⁴*Ibid.* 1933, i, 855.

PYLORUS AND DUODENUM, CONGENITAL STENOSIS OF.*John Fraser, Ch.M., F.R.C.S.Ed.*

Under the heading of "Pyloric Inco-ordination" D. Levi¹ contributes a most helpful article on the problem of congenital stenosis of the pylorus. It is evident from the wording of the title that the author believes in the view that the error arises as the result of a disturbance of the neuromuscular co-ordination of that portion of the autonomic nervous system which is responsible for the activation of the musculature of the pyloric half of the stomach and the pyloric sphincter; that, in a more definite sense, the disturbance arises because the sympathetic element responsible for the filling function of the stomach is at fault, with the result that there is persistent activity of the pyloric sphincter and consequent hypertrophy, so that the body of the stomach, while accepting contents, is unable to pass them on into the more distal segments. This view was originally put forward by John Thomson, who argued the truth of it from clinical observation.

Levi refers to the significance of the biochemical observations of Maizel and Macarthur. These workers have shown that, because of the copious vomiting, the body tissues are deprived of a considerable proportion of their acid radicles, with the result that a condition of alkalosis develops. The significance of this from the point of view of treatment is obvious, for it implies that, instead of administering alkalis or of washing out the stomach with alkaline solutions, chloride solutions should be substituted. Levi believes that these biochemical observations are of considerable importance in arriving at a correct diagnosis in a doubtful case, and the investigation is virtually a routine in the department with which he is associated.

In so far as treatment is concerned, he is all in favour of early interference, and he summarizes the indications as follows: (1) Pyloric obstruction with a palpable tumour; (2) Persistent vomiting with gastric delay and alkalosis; (3) Pylorospasm in which weight does not increase in spite of medical treatment. The operation of **Pylorotomy** (Rammstedt) is that recommended, and, in order to prevent the risk of intestinal infection, he insists on the importance of **Gastric Lavage** prior to operation, using normal saline instead of the bicarbonate solution which is so often recommended.

T. H. Lanman and P. J. Mahoney² have published their experience in 425 cases. It is encouraging to find that the mortality rate has dropped from 10.4 to 2 per cent, and they are fully satisfied that, with attention to the preparation detail of countering dehydration and alkalosis, the operation has become what may be termed safe. It is most significant that from the early part of 1930 up to June, 1932, no death was recorded; the operation figures from which this satisfactory percentage arises are not stated.

The paper covers the ground which has been reviewed on previous occasions, but reference should be made to the fact that in the experience of the authors the pylorus becomes increasingly vascular in children older than six weeks. They attribute this to a superimposed element of pylorospasm which, though present in all cases, is increased as the result of prolonged symptomatology. This observation is mentioned because it raises the question of the risk of hæmorrhage subsequent to the pylorotomy.

C. P. Lapage³ draws attention to the incidence of pyloric and duodenal stenosis in mongols. He records three cases, two of pyloric stenosis and one of duodenal obstruction. He considers that pyloric stenosis and mongolism have increased in the last twenty years, but he marshals no real facts in support of his contention, nor does he draw any significant conclusions.

The results of operation in congenital pyloric stenosis form the subject of discussion in two papers. C. Hakki⁴ recalls his results in 20 cases observed

over a period of seven years; there were 3 fatalities, but only one could be directly ascribed to the operation, and all occurred in feeble children. The end-results were analysed at periods varying from one to six years after operation, and in every case an excellent result was recorded.

The effects of the operation as estimated by X-ray examination are recounted by G. Calinich and R. Zenker.⁵ This paper contains a considerable amount of detail, but the ultimate findings may be recorded as follows. After periods varying from ten months to four years subsequent to the operation in a total of 26 cases, 13 showed normal stomach function, 3 evidenced unduly rapid emptying, and 3 indicated some measure of pyloric obstruction. Taken as a whole, the final conclusion arrived at was that the functional end-results were extremely good.

REFERENCES.—¹*Practitioner*, 1933, Jan., 67; ²*Surg. Gynecol. and Obst.* 1933, Feb., 205; ³*Brit. Med. Jour.* 1932, ii, 350; ⁴*Rev. de Chir.* 1932, Dec., 802; ⁵*Deut. Zeits. f. Chir.* 1933, March, 444.

PYOPERICARDITIS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Empyema of the pericardium or purulent pericarditis is a rare condition and, frequently, when present is unsuspected. If unrecognized, it is a fatal disease, but more than half of the cases can be saved by early drainage. The primary focus is often difficult to locate, but direct extension of infection in cases of pneumonia and empyema appears to be a common cause. Occasionally pyocarditis is a complication of such obvious conditions as osteomyelitis.

J. D. Bisgard¹ states that the constant churning action of the heart tends to impede the formation of inflammatory adhesions and often causes fibrin to be deposited on the heart and parietal pericardium in concentric rings and layers comparable to the architectural structure of the onion. Such general signs as a friction rub, precordial and epigastric pain, cyanosis, dyspnoea, and tachycardia may arouse suspicions, especially when combined with an unexplained rise in temperature. The X rays show an abnormally shaped and enlarged heart shadow which changes with alteration of the position of the patient. A needle cautiously introduced through the left costal xiphoid angle may reveal the presence of pus.

TREATMENT.—When the diagnosis is made there is no question as to the method of treatment. Free drainage is indicated. One or two costal cartilages are resected, the pleural reflection is deflected laterally, and the pericardium is exposed. There is a difference of opinion as to the form of drainage to be employed. Some authorities advocate free open drainage and irrigation, others air-tight drainage as in cases of empyema. The reviewer suggests that if the pericardium is distended by the presence of pus the compression on the heart should be released by gradual decompression in much the same manner as is adopted in cases of over-distension of the urinary bladder. This could be accomplished by the rapid introduction of a drainage tube (various instruments for closed vesical drainage, such as Kidd's, could be employed) through which the pus for the first twenty-four hours is permitted only to escape in small quantities. The rule that "when an organ or system is suffering directly from pressure effects or indirectly from back pressure, the greater the pressure the more gradual should be its relief" applies throughout the entire surgical field (Wheeler²). By such means the high mortality (which Bisgard gives as 45 per cent) in cases receiving surgical drainage might be reduced.

REFERENCES.—¹*Amer. Jour. Surg.* 1932, July, 1; ²*Canad. Med. Assoc. Jour.* 1931, xxiv, 3.

PYURIA IN CHILDREN, KETOGENIC DIET IN. (*See also*
PYELOCYSTITIS.)*Reginald Miller, M.D., F.R.C.P.*

Although it may be useful here to make reference to the several papers which have recently been published on this subject, it is even yet extremely difficult to estimate what advantages, if any, the adoption of a ketogenic diet has over the older methods of treatment of pyuria in children. The subject is one of great difficulty. On the one hand, as everybody knows, there are very numerous acute or subacute cases which can be easily cured by various drugs; and on the other hand there is the smaller group, generally dependent on some anatomical abnormality of the urinary tract, in which cure is either impossible or only temporary. To make matters worse, there are also cases in which the change from one drug to another will effect a cure for no known reason; while spontaneous cures when all drugs have been tried and failed are by no means unknown. What, then, is wanted is information whether a ketogenic diet can cure cases in which other measures have failed, and if so whether it can be relied upon to do so, and what is the outlook as regards relapses. Pending further elaboration or improvement in the technique of the treatment it seems assured that this form of therapy will occasionally cure cases that have resisted other lines of treatment, but that it can be relied upon to do so or to prevent relapses seems certainly untrue.

H. F. Helmholz,^{1,2} who first recorded results of the treatment of pyuria in children by a ketogenic diet in 1931, has now published a further paper³ on the same subject, in which he notes that O. Nielson⁴ in 1920 fed a cream mixture in the treatment of urinary infections with good results. He summarizes his results as follows: (1) By the use of the ketogenic diet the urine can usually be rendered bactericidal when its *pH* is below 5.6. (2) The bactericidal power apparently is not due to acidity alone or to the presence of diacetic acid or sodium diacetone. Acidity in synergy with substances hitherto not yet determined probably accounts for this bactericidal action. (3) Ketourine of a *pH* of 5.5 is an excellent antiseptic for clearing urinary infections, and ketonuria should prove useful in the preparation of patients for operation on the urinary tract. (4) By means of the ketogenic diet three patients with major urinary anomalies have been freed from infection. At the Mayo Clinic no other method of treatment has been successful in this type of case. The clearing of an infection by means of the diet does not necessarily mean permanent cure.

J. B. Rennie⁵ reports as follows: "In the Royal Hospital for Sick Children, Glasgow, 6 cases have been treated with ketogenic diet. Of these, 2 appeared to be cured. Of the remaining 4, 2 had sterile urines for a few days but relapsed, and 2 were quite unaffected by the diet. The 4 cases in which ketogenic diet was ineffective all presented some abnormality of the urinary tract, demonstrated by intravenous pyelography. The 2 cases which cleared up were of short duration and showed no abnormality of the urinary tract. Although ketogenic diet would appear to be as good a method as any other of rendering the urine sterile, there are several disadvantages. Because of the nature of the diet its use is limited to older children, and complete co-operation of patient and nursing staff is required. In febrile cases there are obvious drawbacks to such a marked reduction of carbohydrate intake."

In a longer publication devoted to this subject the same author⁶ gives it as his opinion that if no abnormality is present ketogenic diet is probably an efficient method of clearing up a urinary infection, but it is questionable if it has any advantage over the older forms of treatment. Its use would appear to be limited to older children. In the acute stage of the disease when fever is present it seems unwise to give a diet so deficient in carbohydrate. Further, the diet can only be used satisfactorily in hospital, and even there co-operation

on the part of the patient is required. And again: "It would appear that ketogenic diet is of little value as a curative agent in pyuria associated with abnormality of the urinary tract".

M. F. Campbell⁷ states that he has seen four infants in whom pyuria was noted from birth. "Some", he says, "are born with pyuria (few), others achieve it (the usual clinical event), while others have urinary infection thrust upon them (instrumentation introduction, relatively rare)".

REFERENCES.—¹*Proc. Staff Meet. Mayo Clinic*, 1931, vi, 609; ²*Acta Paediat.* 1932, xiii, 195; ³*Jour. Amer. Med. Assoc.* 1932, xcix, 1305; ⁴*Ugeskr. f. Læger*, 1920, xc, 843; ⁵*Glasgow Med. Jour.* 1933, xxvii, 113; ⁶*Arch. of Dis. Childh.* 1933, viii, 47; ⁷*Jour. Amer. Med. Assoc.* 1932, xcix, 2231.

RADIOTHERAPY. (See also CANCER, RADIUM TREATMENT OF; X-RAY AND RADIUM THERAPY.)

RADIOTHERAPY IN GYNÆCOLOGY.

Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.

Radiotherapy in Non-malignant Gynæcological Conditions.—The treatment of non-malignant gynæcological lesions by means of radiotherapy is considered by N. S. Finzi, Malcolm Donaldson, and others in a discussion held this year between the combined sections of Radiology and Obstetrics and Gynæcology at the Royal Society of Medicine.¹

The chief benign conditions in which radiotherapy may be employed are classified by Donaldson as follows: (1) Irregular hæmorrhage from the uterus associated with the menopause; (2) Menorrhagia or irregular bleeding caused by fibroids; (3) Certain cases of menorrhagia in young patients where there is no gross abnormality of the pelvic organs; (4) Tuberculosis of the cervix or vagina; (5) Leucoplakia of the vulva.

The most useful application of irradiation is probably seen in cases of *menopausal menorrhagia*, and Finzi observes that treatment is so certain in its results that surgery is not justified owing to the increased risk and longer convalescence. X rays and radium give equally good results provided that the technique and dosage are correct, but radium is more rapid in its effects. On the other hand, the rather distressing vomiting which so commonly is associated with the introduction of radium into the uterus is eliminated when X rays are used. The latter probably act entirely on the ovaries, and although a single application with a voltage of 180,000, a filter of 0.5 mm. copper, and a distance of 30 to 40 cm. may be used, Finzi advocates three series of treatments. In each series three to five applications spread over three successive days are given. The interval between each series is four weeks from the first day of one to the first day of the next. The author employs 150 kv. undulating current, with a filter of 5 mm. aluminium, at a distance of 24 to 30 cm.; 85 per cent to 90 per cent of a full erythema dose is given at the first series, but this is reduced at subsequent treatments, and care is taken to include both ovaries within the two anterior and the single posterior fields.

If women under 38 or 40 years of age are treated by this method there is a possibility of return of the menstrual function after a few years; and it is important to note that should pregnancy occur within this period there is the possibility of the birth of a deformed fetus. *Microcephaly* is the most common abnormality in a pregnancy resulting from fertilization of a damaged ovum.

In very anæmic patients radium is more suitable than X rays because its action is quicker.

Contrasting the value of X rays and radium in the treatment of the abnormal menopause, Malcolm Donaldson points out that although both probably act in the same way, i.e., by their direct effect upon the ovaries, radium has certain

very definite advantages. In the first place the uterus and cervix are efficiently explored to exclude malignant disease. In two cases the author recently discovered unsuspected early carcinoma during routine curettage before the insertion of radium. Secondly, during the preliminary investigation of the pelvic organs under anaesthesia, the pressure of any inflammatory mass which would flare up under irradiation can be excluded.

When radium therapy is proposed, it is not uncommon for patients to raise the question as to the effect which such treatment will have upon menopausal symptoms and also upon the sex instinct. Donaldson answers the first by stating that the same menopausal symptoms, e.g., 'flushings', follow radium therapy as if no such treatment had been given. The production of an artificial menopause after the age of 40 differs in no way from that of a natural 'change of life'.

As to the effect upon the sex instinct, the author is of opinion that radiation therapy exerts no specific influence. In the course of years there is sometimes a definite diminution in the size of the vagina which may produce dyspareunia, but this disability is just as likely to supervene upon the natural menopause as the artificial climacteric.

A matter of considerable importance in intra-uterine radium therapy is the dosage required to produce the optimum effect. In England the amount of radium commonly used is 50 mgrm. of radium element with a filter of from 0.5 to 1.5 mm. of platinum. In a series of 92 cases of menopausal bleeding treated at St. Bartholomew's Hospital with an individual dosage of 3600 mgrm.-hours, the percentage of cures based upon the production of amenorrhœa was 96.8. Norman White,¹ quoting figures supplied by the Radium Registrars at University College Hospital, states that 1200 mgrm.-hours will usually produce amenorrhœa in a patient aged 46 or older, and that 1800 mgrm.-hours generally effect a similar result in women aged from 41 to 45. Under 40 years of age 1800 mgrm.-hours are not sufficient to produce permanent amenorrhœa; in other words, the older the patient the smaller is the dose required. Whilst this is true for the majority of patients, individual variations occur owing to exceptional resistance or susceptibility of individual tissues. The author cites an instance where 1200 mgrm.-hours failed to produce amenorrhœa in a woman aged 46, though the same dose produced apparently permanent amenorrhœa in two patients aged 29; 1500 mgrm.-hours also failed in two women over 50 years old. For these reasons White advocates a routine dose of 3000 mgrm.-hours for all patients in whom it is desired to produce permanent amenorrhœa. If the uterus is much larger than normal this may be increased to 3600 mgrm.-hours, but in the author's experience the 3000-mgrm. dose has so far proved to be entirely adequate.

Complications of Radium Therapy in Gynæcology.—With the extension of radium therapy to smaller hospitals and clinics as distinct from the large teaching centres, it is essential that those who use this powerful agent should possess a knowledge of its dangers and limitations.

The advertisements of commercial agencies who rent radium, inviting the general practitioner to send a description of the case, to be followed by directions with the proper dosage, have prompted G. Gray Ward¹ to publish a timely warning of the complications which may ensue upon the application of radium without special knowledge or skill. The author stresses the important fact that although the renting of radium is of course perfectly justifiable, the knowledge and judgement of how and when to use it cannot be obtained by 'correspondence' but only be bought by careful study, personal experience, and observation in established radiologic clinics. Safety in the use of radium depends not only upon the amount of radium used, and its distribution in appropriate containers and effective screening, but on the placing and maintaining of

the radium in situ. The duration of the primary application, and the time and dosage of re-radiation and deep X-ray therapy, combined with a careful frequent follow-up, are also essential factors if the best results are to be obtained.

The location and extent of malignant disease in a given case must be carefully studied, together with the type of cell and degree of maturity, since if larger doses of radium are given than are actually required, normal structures are destroyed. Such action may readily result in the production of septic discharges, hæmorrhages, injury to adjacent viscera, and even fistulæ. Gray Ward points out that the unfortunate results of over-radiation are commonly attributed to the extension of the carcinoma; the action of the radium is blamed and consequently condemned. Too frequently repeated radiations, on the other hand, are liable to result in the so-called 'late reaction' of radium. Six or twelve months after the initial treatment dense infiltration of the tissues, pelvic pain, and ulceration may develop which are likely to be attributed to a local recurrence of the disease when actually they are the result of excessive irradiation.

Very little has been written regarding the frequency of post-radiation symptoms, but their frequency in all clinics is without question. Amongst 558 cases of cervical carcinoma in the author's clinic, 21·3 per cent of the patients exhibited some form of post-radiation morbidity. In the later years of this series there has been a gradual decline in the frequency of complications following radium, which is attributed to the greater care paid to details of technique and to improvement in judgement as a result of experience. The *primary mortality from radium therapy* in carcinoma of the uterine cervix should not exceed 2 per cent. When death occurs it is usually the result of the unwise application of radium in the presence of very extensive disease complicated by acute sepsis.

In many clinics *vesical and rectal irritability* is a frequent post-radiation complication. In Gray Ward's clinic such morbidity is quoted as 4·5 per cent, a low figure which is attributed to care taken in obtaining the maximum of distance screening by distending the vagina to the utmost with gauze packing, and the use of a self-retaining catheter in the bladder to maintain collapse of this organ whilst the radium is *in situ*.

When a carcinoma invades the anterior vaginal wall the danger of producing a *vesico-vaginal fistula* with radium is very real if the dosage is too large. The proper dose in an individual case must be based upon experience and the thickness of the vesico-vaginal septum. The risk of this serious complication is particularly great when irradiation is employed for cancer that has developed in the cervical stump after a previous supravaginal hysterectomy: 40 of these cases occurred in Gray Ward's series, an incidence of 7·2 per cent, and the author observes that the incidence of fistula was increased two and a half times. He advocates reduction of radiation to one-half, repeating as necessary, in the presence of this increased risk.

Recto-vaginal or ileo-vaginal fistula subsequently developed in 4 per cent of Ward's 558 cases, but, as the author says, it is not possible to say what proportion were due actually to the radiation and what to extension of the disease. Cases having a history of previous pelvic inflammation appear to be more liable to intestinal fistula as a complication of the treatment, owing to the proximity of an adherent loop of bowel. Amongst other complications which swell the figures of post-irradiation morbidity *pyometra* must be noted. Its incidence was 3·6 in the author's series and is attributed to infection of the endometrium and occlusion of the cervical canal from contraction due to the formation of dense connective tissue. A *monthly 'follow-up'* is advocated in order to discover this complication in its incipency, which may be suspected from the presence of cramp-like pains with enlargement and softening of the uterine body. The careful passage of a uterine sound confirms the diagnosis.

The presence of pathogenic bacteria on a sloughing and ulcerated carcinomatous ulcer of the uterine cervix must at all times be envisaged, and the onset of septic complications may be largely prevented by thorough preliminary vaginal and cervical antiseptic preparation, and the avoidance of trauma when dilating the cervix and placing the radium containers *in situ*. The presence of pyrexia or signs of coexisting pelvic inflammatory disease are of course contra-indications to immediate radium therapy.

When radium is used in the treatment of non-malignant conditions the utmost care is requisite to avoid the results of over-dosage. One of the most distressing complications that can happen is the production of *permanent amenorrhœa* when radium therapy is applied to check menorrhagia in a young woman. When uterine bleeding does not yield to curettage or hormone therapy, a small dose of 200 to 400 Ra. mgrm.-hours may be given with safety. With 600 mgrm.-hours there is a real danger of causing uterine atrophy and permanent amenorrhœa with sterility. As the author observes, it is far better to under-radiate these cases with the understanding that the treatment may have to be repeated than to give too much!

The consideration of this rather formidable list of possible complications, which cannot be avoided even in the most experienced hands, but may be reduced in number by adequate knowledge of the action of radium and care in the technique of application, emphasizes only too well the necessity for proper training. The damage which may be inflicted from over-radiation on the one hand, and the failure to cure by insufficient radiation on the other, are important points which must ever be present in the minds of all who enter the field of radium therapy.

REFERENCES.—¹*Proc. Roy. Soc. Med.*, 1933, March, 637; ²*Amer. Jour. Obst. and Gynecol.* 1933, Jan., 1.

RECTAL INCONTINENCE.

J. P. Lockhart-Mummery, F.R.C.S.

ETIOLOGY.—J. P. Lockhart-Mummery¹ discusses the causes and treatment of this condition. He gives the following causes: (1) Operations and injuries, such as childbirth, resulting in permanent damage to the sphincter muscle; (2) Derangement of the nerve-supply, such as paraplegia, disseminated sclerosis, and tabes dorsalis; (3) Retention and overflow—a common cause in old people from impaction of feces in the rectum, and sometimes seen in young children; (4) Congenital absence of the external sphincter muscle; (5) A patulous condition of the anus from rectal prolapse or bad prolapsing piles.

TREATMENT.—As regards treatment, he believes that all cases can be very considerably benefited by operation and most cases can be definitely cured. The most difficult cases are those where there is extensive scarring and much fibrous tissue. Where any portion of the external sphincter is still present this can be made to surround the opening and function properly again by a carefully-planned plastic operation, but success will depend very largely upon primary union being obtained, which is not always easy in this situation. Apart from congenital absence of the sphincter muscle and diseases of the central nervous system, there are few cases of incontinent anus that cannot be cured by a carefully planned operation.

REFERENCE.—¹*Lancet*, 1933, ii, 535.

RECTUM, CANCER OF.

J. P. Lockhart-Mummery, F.R.C.S.

EARLY DIAGNOSIS.—Most of the writers on this subject stress the necessity of early diagnosis, so as to enable cases to be treated at an earlier stage than is at present usual. The great majority of cancers of the rectum are not detected until they have passed the stage at which they are really curable by

any form of radical surgery. All surgeons are agreed that in the early stages modern operative technique is quite able to cure cancer of the rectum with comparatively little risk. Thus, out of 215 cases from the records of St. Mark's Hospital quoted by Sir Charles Gordon-Watson¹, 101 already showed lymphatic invasion, while out of 52 cases operated on in 1928, there were 37 without lymphatic invasion, 28 of which were alive after three years, while out of the 15 cases with lymphatic invasion, only 1 was alive after three years.

GRADING AND CLASSIFICATION.—The importance of grading different cases of cancer of the rectum according to the amount of spread that has taken place was first stressed by J. P. Lockhart-Mummery² in 1926, who pointed out that there was very great difference in the recurrence rate, depending upon the amount of extension that had occurred, and that this could be estimated by a careful examination of sections of the tumour after operation. Since then Cuthbert Dukes³ has extended this method of grading and made it more accurate. His latest report is based on the study of 215 operable cases treated by excision of the rectum. The cases are classified in the following groups:—

Group A—where the growth does not extend beyond the wall of the rectum.

Group B—where there is extension into the extrarectal tissues, without metastases.

Group C—all cases where there is involvement of the lymph nodes.

The whole classification is based upon careful microscopical examination both of the tumour and of any glands or metastases. Of these 215 cases, 18 per cent belonged to *Group A*, 35 per cent to *Group B*, and 47 per cent to *Group C*. There were no operative deaths in *Group A* and no recurrences. In *Group B* there was 1 death from operation and 6 deaths from recurrence, and in *Group C* 4 deaths from operation and 13 from recurrence.

W. B. Gabriel⁴ reviews 370 cases of rectal cancer treated at St. Mark's Hospital between the years 1910 and 1931 by the Lockhart-Mummery **Perineal Excision**. The operative mortality is shown in *Table I*. It will be noted that the mortality has been steadily decreasing with the increasing experience of the operation on the part of the surgeons and nursing staff. *Table II* shows the results at the end of five years in 189 cases.

On a three-years' basis the percentage of cures in *Group A* cases was 86, *Group B* 73, and *Group C* 19.

The method of grading tumours before operation by Broders' method of biopsy has also been studied by Cuthbert Dukes³ and compared with the grading done by examination of specimens after operation. He found that the method was not very uniform in its results, but that it was of definite value in prognosis, as all of the patients with *Grade I* lesions were alive after three years, whereas

Table I.—OPERATIVE MORTALITY OF PERINEAL EXCISION IN RELATION TO INCREASING EXPERIENCE WITH THE OPERATION.

	M.	F.	DATE	OPERATIVE MORTALITY	M.	F.
First 100 cases	68	32	1910-22	16	11	5
Second 100 „	66	34	1922-27	13	11	2
Third 100 „	68	32	1927-29	10	8	2
Next 70 „	47	23	1930-31	4	3	1
Total 370 „	249	121	1910-31	43	33	10

PLATE XLIV

CAVERNOUS ANGIOMA OF RECTUM—*continued*

(R. BENSAUDE AND A. BENSAUDE)

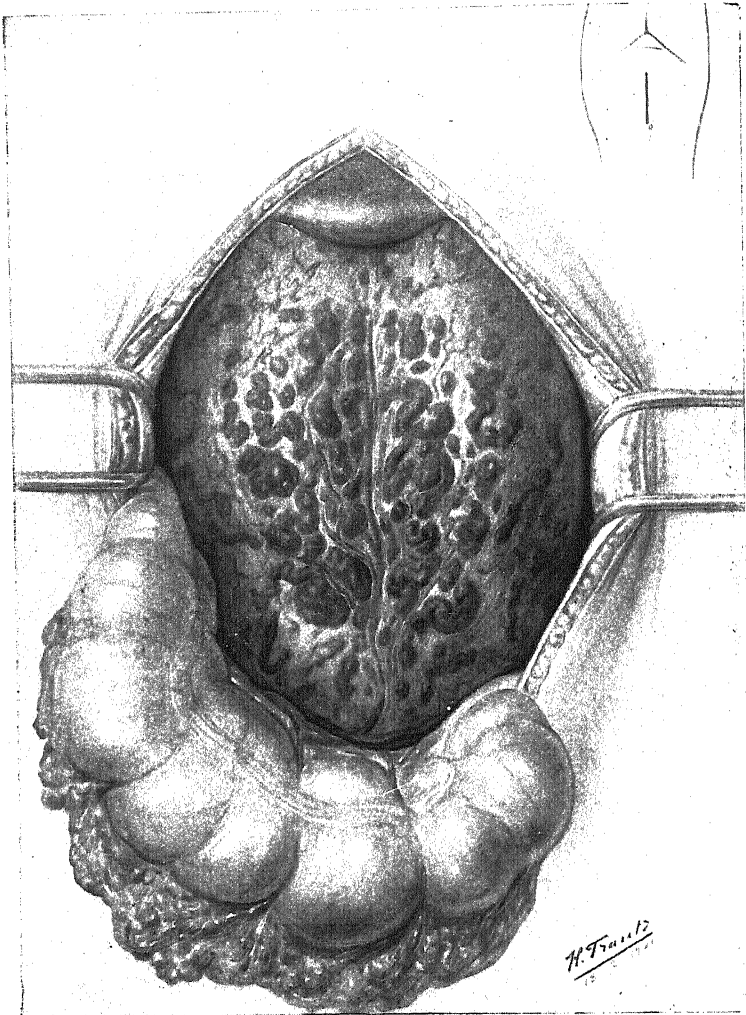


Fig. B.—Showing the appearance of outside of rectum during laparotomy.

RECTUM, CAVERNOUS ANGIOMA OF (Cirroid Aneurysm).*J. P. Lockhart-Mummery, F.R.C.S.*

R. Bensaude and A. Bensaude¹ give a very full description of fourteen cases of this rare condition. The appearances are shown in *Plates XLIII, XLIV*. *Plate XLIII* shows the appearance of the rectum from inside through the sigmoidoscope, and *Plate XLIV* the appearance of the outside of the rectum during laparotomy. The condition is congenital and is characterized by the presence of huge blood-vessels forming cavernous spaces in the wall of the gut and projecting into the lumen of the bowel. There may be a more or less discrete tumour in one part of the rectal wall, or almost the whole of the rectum and part of the pelvic colon may be involved. The blood-vessels forming the tumour may be mainly veins or arteries; as a rule large pulsating arterial vessels predominate. The condition is a very serious one, as sooner or later hæmorrhage of a most severe type occurs, which is often fatal. There is no difficulty about the diagnosis if a sigmoidoscope is used, as the large blood-vessels can be easily seen. In most cases little can be done to treat the cases beyond using precautions to prevent damage occurring to the dilated vessels and dealing with hæmorrhage when it occurs. Anything in the way of radical operation is quite contra-indicated as a rule. The feeding vessels passing into the tumour are enormous and the dangers of attempting to remove the affected portion of bowel are so considerable that the procedure is hardly justified. Many of the patients live for a very long time, though most of them come to grief in the end from hæmorrhage. Of Dr. Bensaude's cases four died of hæmorrhage, three were operated on successfully, two died from the operation, and in one operation was unsuccessful in remedying the condition. Three cases were treated with **Radiotherapy and Cauterization**, one after a preliminary colostomy, with improvement. The authors point out that the condition is sometimes associated with a similar condition in other parts of the body. Thus one of their patients had a cavernous angioma of the scrotum, and another patient had a similar condition involving the bladder and ureter.

REFERENCE.—¹*Presse méd.* 1932, Nov. 19, 1739.

RECTUM, PROLAPSE OF.*J. P. Lockhart-Mummery, F.R.C.S.*

E. B. Potter and J. M. Wellman¹ give the results of the treatment of rectal prolapse in children with **Alcohol Injections**. The alcohol is injected under anaesthesia into the submucous tissue with a long aspirating needle, 1.5 to 3 c.c. of alcohol being injected on either side. They treated 13 cases, with 11 cures. [This is an old treatment that is revived from time to time. The original cases were reported by Swinford Edwards many years ago. Alcohol is not very safe, as it is liable to cause sloughing, though there appear to have been no complications in the cases reported by Potter and Wellman. Five per cent **Carbolic Acid in Almond Oil** is now used at St. Mark's Hospital, and is probably safer than alcohol and quite as efficacious.—J.P.L.-M.]

E. G. Martin² advocates a **Colopexy** operation for rectal prolapse in adults. A laparotomy is performed and the bowel pulled up till it is taut. The longitudinal muscle band of the colon is stitched to the fibres of the psoas minor in the left iliac fossa after dividing the posterior peritoneum. This operation in the hands of other surgeons has proved dangerous owing to strangulation of a coil of small gut through the opening left behind the fixed area of colon.

This complication has on several occasions occurred some years after the operation for prolapse. If colopexy is performed, it should be done in such a manner that there is no gap left through which an internal strangulation of

small gut can take place. The method suggested by Louis Hirschman (*see* discussion on Martin's paper) of obliterating the fossa between the opposing folds of mesentery on the outside of the colon by careful stitching is better and safer than a colopexy.

REFERENCES.—*Amer. Jour. Surg.* 1933, Feb., 297; *Jour. Amer. Med. Assoc.* 1932, July 30, 368.

RECURRENT LARYNGEAL NERVE PARALYSIS.

F. W. Watkyn-Thomas, F.R.C.S.

A. B. Smith, V. F. Lambert, and H. L. Wallace¹ report on 235 cases of paralysis of the recurrent laryngeal nerve seen over a period of twenty-five years in the Ear and Throat Department of the Edinburgh Royal Infirmary. No cases have been included in which there was present any intrinsic disease of the larynx such as tuberculosis or syphilitic ulceration.

Of the total number of cases investigated more than two-thirds occurred in males. A comparison of the age-sex incidence shows that up to 40 years of age the females preponderate. This is probably due to the much greater incidence of goitre in women. The great rise in the male cases after the age of 40 is due, in this collection of cases at any rate, to the high incidence of mediastinal tumour and aortic aneurysm among men in the period between 40 and 60. Thus in men especially recurrent laryngeal palsy is usually a danger sign.

In the whole series 50 cases were due to tumours (mediastinal tumour, carcinoma of the œsophagus, and enlarged or malignant glands in the neck); 30 were due to goitre, including 12 which were the result of operation injuries and 5 cases of malignant disease of the thyroid; aneurysm, heart disease, and 'broadening of the aortic arch' accounted for 43; respiratory troubles for 25; and nervous diseases for 15. In the whole series there was only one case in which the condition was caused by diphtheria, but there were 23 in which no cause was discovered and 7 which 'followed a chill' may not unfairly be added to this last group, although cases have been reported by Fraser and by Birkett in which recurrent palsy has followed exposure to cold when motoring.

Several interesting points appear in the figures. It is usually held that apical tuberculosis as a cause of laryngeal palsy is more common in women than in men; these figures contradict it; also in this series paralysis was found in cases where the disease was not apical. It is usually stated that in women tuberculosis is the most common cause of the paralysis; here goitre was the most common. It is possible, as the authors very fairly point out, that the diagnosis of goitre is easier than that of phthisis, and this may explain the discrepancy.

In the great majority of cases the left cord is affected (160 against 52 right and 23 bilateral). In goitre only is the right cord affected as frequently as the left.

In 20 cases which came up for re-examination there was complete recovery in 5, but in 4 the cause of the paralysis had never been found, and in the fifth there had been a positive Wassermann.

Much attention is paid to the position of the vocal cords. The paralysed cord is usually said to be either in the middle line in the position of adduction, or in the 'cadaveric position'—that is to say, midway between adduction and abduction. [Strictly speaking the term also implies, in old-standing cases, that the free edge should be slightly curved and atrophied, and that the affected cord should lie on a lower plane than the sound one.—F. W. W.-T.]. Semon held that paralysis of the recurrent laryngeal was always primarily a paralysis

of the abductors which later became complete; this was known as 'Semon's law'. In this series of cases the majority of paralysed cords occupied the cadaveric position; in one case only was a paralysed cord observed to change position from the median line to the cadaveric position; thus little support is given to 'Semon's law'. Two of the patients who recovered full movement had the cord in the cadaveric position, so it seems that a cord may recover normal function irrespective of its position.

In many cases there was compensatory movement of the healthy cord over the mid-line, in one case the patient was able to sing. The authors found considerable recovery of voice within a year of the onset of the paralysis.

G. B. New and J. H. Childrey² analyse 217 cases of vocal cord paralysis seen at the Mayo Clinic. On the whole, their findings and conclusions agree fairly closely with those of Smith, Lambert, and Wallace. In their cases the left cord was paralysed in 127, the right cord in 58, and both cords in 32. Of the 32 cases of bilateral paralysis, 3 were congenital. In their series they include 10 cases where the lesion was caused by tertiary laryngeal syphilis. In 6 of these there was complete bilateral abductor paralysis, and 2 patients needed tracheotomy. Of 9 cases caused by tabes, 6 were bilateral, but in only 1 was tracheotomy required. Among 29 cases where the paralysis was due to mediastinal disease there were instances of carcinomatous metastases from primary growths in the breast, rectum, and pelvis. Another interesting point is that in 24 cases due to aneurysm of the aorta, there were 4 cases of bilateral paralysis. It is frequently stated that this is very rare.

There were 10 cases in which the paralysis could fairly be attributed to a cardiac lesion, in 3 adhesive pleuropericarditis, in 1 emphysema, in 1 dilatation of the aorta, and in 7 chronic endocarditis and mitral stenosis with either dilatation or dilatation and hypertrophy of the left auricle. There is some doubt as to the actual cause of recurrent laryngeal paralysis in these cases; it has been suggested that it may be due to pressure by the dilated left auricle, to traction on the aorta by the dilated heart, to mediastinitis, or to pericarditis.

Eleven cases, all unilateral, were due to pulmonary tuberculosis. In 8 the paralysis was on the left side. This again is contrary to the received opinion that it is more common on the right, owing to the proximity of the recurrent laryngeal to the right apex; this is also of interest as confirming the observation of Smith, Lambert, and Wallace that laryngeal palsy in phthisis is not necessarily due to apical disease.

In a large proportion (said to be from a third to a half of all cases) no real cause of the paralysis can be found, and this New and Childrey confirm.

They are sceptical of the truth of 'Semon's law'. For example, when the nerve has been injured during a thyroid operation the affected cord is usually in the middle line at first, and later it either recovers or stays fixed in the mid-line. They have never seen a cord move from the mid-line to the cadaveric position in such a case.

They conclude that: (1) A vocal cord with partial paralysis may completely recover its normal function. (2) A vocal cord fixed in the median line may recover, but it usually remains fixed in that position. (3) A vocal cord fixed in the cadaveric position may completely recover or may remain in its position, but usually it swings in to the mid-line and remains there; if the condition is bilateral, dyspnoea develops as the voice improves. Patients with median line fixation had shown symptoms for an average period of twenty months, those with cadaveric position for an average of four months only. No patient with a cord fixed in the median line when first seen showed afterwards a change to the cadaveric position.

[The conclusions to be drawn from these papers are that we cannot accept 'Semon's law' without further inquiry; that paralysis of one cord, or even of both, is not always permanent; that a paralysis due to pulmonary tuberculosis is not diagnostic of apical disease; that it is rarely due to diphtheria; and that, especially in men of the 40 to 60 age period, it must be regarded as a danger sign.—F. W. W.-T.]

REFERENCES.—¹*Edin. Med. Jour.* 1933, July, 344; ²*Arch. of Otolaryngol.* 1932, xvi, 143.

RENAL DISEASES. (See also KIDNEY.) *H. L. Tidy, M.D., F.R.C.P.*

Classification.—J. Gray¹ (Aberdeen), in a Special Report to the Medical Research Council, gives the following classification of renal diseases:—

1. Acute nephrosis	} Acute conditions
2. Acute focal (bacterial) nephritis	
3. Acute nephritis	
4. Subacute nephritis	} Later conditions
5. Early chronic nephritis	
6. Nephrotic nephritis	
7. Chronic nephritis	
8. Kidney of essential hypertension (arteriolo-sclerotic kidney)	} Conditions independent of true nephritis
9. Arteriosclerotic kidney	
10. Amyloid kidney	

This is based on pathological studies of kidneys from autopsy combined with such clinical records as are contained in the ward notes.

Acute hæmorrhagic nephritis is noted as being "drawn from groups 1, 2, and 3," but is not included in the classification. Nephrotic nephritis includes the type commonly known as 'nephrosis' and also 'nephrotic' stages of nephritis, the author stating that it corresponds to 'parenchymatous nephritis'. 'Chronic nephritis' is limited practically to chronic glomerular nephritis [a special restricted use of a title commonly employed with a wider meaning].

Gray rejects subdivisions of 'arteriolo-sclerotic' kidney into benign and malignant or other types.

The material and method resemble those of Russell, but the result is different. Gray's classification is closer to present ideas and the nomenclature of others. Both authors suffer from the difficulty of correlating highly specialized pathological studies with rough clinical records, and from the absence of acute hæmorrhagic nephritis from the prominent position which it occupies in clinical nephritis.

Renal Efficiency Tests.—Cai Holten² (Copenhagen) has applied the 'creatinin clearance test' as a measure of the progress in acute nephritis. The details of the test have been described by Holten and P. B. Rehberg.³

The formula employed is $\frac{\text{Cr U}}{\text{Cr B}} \times V = F$, where Cr U is the percentage of creatinin in the urine, Cr B the percentage in the blood, and V the volume of urine excreted per minute. F is then the amount in cubic centimetres of blood cleared of creatinin per minute. The normal minimum is 60 c.c. per square metre body surface area, calculated from Du Bois's tables, the average being 83.3. In acute nephritis, including acute hæmorrhagic nephritis, the test may reveal deficiency of renal function after blood and albumin are no longer present in the urine and the specific gravity is normal. In such cases treatment should be continued.

Holten's test and formula is on the same lines as van Slyke's 'urea clearance test', but Holten does not employ \sqrt{V} which is open to criticism in van Slyke's

formula. Holtzen introduces, with reason, the surface area in calculating normal figures for children. Details are not given by which Holtzen's and van Slyke's tests can be compared, and the 'follow-up' data are too scanty to draw conclusions as to the accuracy of the test.

Acute (Convulsive) Uræmia.—Horace Evans⁴ has published a careful study of this condition under the title "Hypertensive Encephalopathy in Nephritis". The author finds that comparatively little attention has been paid to it in this country. The condition is rare: it was observed in 7 out of 90 cases of acute nephritis, and in only 2 of 70 cases of chronic nephritis. A summary is given of each of these 9 cases. Five of the 7 acute cases were re-examined after varying intervals and were in good health. One of the chronic cases died. The remaining 3 cases were still in hospital. In all cases hypertension was present at the time of the attacks, but subsided later in the acute group. Puffiness of the face was also invariably present; its presence and absence often coincided with the onset and cessation of the encephalopathic symptoms. Œdema was sometimes observed in the shins and back, but was not gross. Amaurosis was present in 5 cases. The blindness was considered to be due to a central lesion, the pupil being usually dilated and reacting to light. Marked pyrexia was noted in 2 cases.

The cause is uncertain. The principal theories are ischæmia due to spasm of the cerebral arterioles, and cerebral Œdema. In the one autopsy no abnormality was found in the brain.

Against cerebral Œdema is the rarity of the condition in cases of nephrosis and gross Œdema, and the occurrence of similar syndromes in lead and eclampsia. In support of the theory of ischæmia is the hypertension, the rapid onset and disappearance of the symptoms, the observation of spasm of the retinal arteries in eclampsia, and the known relationship between lead, angiospasm, and encephalopathy. Volhard believes that spasm of the cerebral arterioles causes ischæmia, which produces cerebral Œdema. The question is still unsettled. Treatment consists essentially in **Blood-letting, Lumbar Puncture, Restriction of Fluid Intake, and Morphia.**

Prognosis in Children with Acute Nephritis.—K. H. Tallerman⁵ has studied the progress in children admitted to the London Hospital for acute nephritis between January, 1927, and January, 1930. The criterion for acceptance as 'acute nephritis' was the clinical diagnosis, the group including both 'haemorrhagic nephritis' and cases with Œdema and other nephritic manifestations. The total was 29, of whom 2 died in hospital after durations of two to four weeks. Of the remaining 27, 25 were examined at an interval of not less than eighteen months after discharge. Of the two patients who did not attend, one was known to be well after eighteen months after discharge: the other had been admitted for purpura, but in hospital developed hæmaturia and symptoms considered sufficient to justify the diagnosis of 'acute nephritis'. No special treatment was followed: the diet was mainly milk, salt was omitted in cases of Œdema, some patients were given potassium citrate, and in those with unhealthy throats tonsillectomy was usually but not invariably carried out.

All the 25 patients examined were in good physical health. As the result of renal tests they were classified as: 'completely recovered' 12, 'recovered' (albuminuria present) 6, 'probably completely recovered' (phenolsulphone-phthalein excretion low) 3, 'renal damage' 4. The recovery rate is regarded as 18 out of 27 cases, i.e., 66·6 per cent. Neither the severity of the original attack nor the length of stay in hospital influenced the ultimate prognosis.

This is a careful study. Details of the cases are reported, and readers can form their own opinion of the progress. Many authorities hesitate to regard albuminuria lightly when it is the sequel of an attack of nephritis. It is also

noticeable that cases with a high blood-pressure at onset did not progress very favourably.

Influence of Magnesium Sulphate on the Kidneys.—Magnesium sulphate has been considerably in use in recent years in the treatment of certain symptoms of renal insufficiency, especially uræmia. It is interesting to note experimental results with diets deficient in magnesium. H. D. Kruse, E. R. Orent, and E. V. McCallum⁶ kept rats on diets practically magnesium free. Changes in the skin were recognizable within a few days, and the animals died between the eighteenth and twenty-third day with violent convulsions. Extensive pathological changes were present. W. Cramer⁷ employed a synthetic diet containing very small amounts of magnesium, though in excess of Kruse's trace. The animals grew well and appeared in a good state of nutrition; but albumin in considerable amounts was found in the urine after four or five weeks. When killed at the end of six weeks, marked changes were present in the kidneys, recorded as "extensive degeneration of tubules and glomeruli without evidence of inflammatory reaction". Calcareous deposits were also present in the tubules and glomeruli in some cases (these were occasionally, though less often, present in control animals on the synthetic diet with added magnesium sulphate). The other organs were healthy and formed a definite contrast to the extensive renal changes. Further investigations are in progress.

Tyrosinosis.—Under this title Grace Medes⁸ describes a case of a hitherto unrecorded error of metabolism of tyrosine. The condition is akin to alkaptonuria, but the block in the disintegration of tyrosine occurs slightly earlier in metabolism. The substance excreted is *p*-hydroxyphenylpyruvic acid. The patient is unable to oxidize this to the 2:5 dihydroxy derivative. In alkaptonuria this step is performed, but there is a block in the next stage of oxidation, which opens the benzene ring. In the patient in question this oxidation could be achieved, since homogentisic acid when administered *per os* did not appear in the urine. The substance produced does not cause any abnormal pigmentation such as ochronosis, but in the urine reduces Benedict and Fehling's solution.

TREATMENT.—A. F. Hartmann,⁹ with others, has employed intravenous injections of **Gum Acacia** in the treatment of the *œdema of severe nephrosis*. This method has been tried previously but results have been insignificant, partly owing to the rapidity with which acacia is excreted, and partly from the quantity of acacia used being too small. The 'colloidal osmotic pressure' of normal serum is usually between 30 and 40 cm. of water. In *œdema* it is under 20 cm., the mean being 13 cm. A deficiency of at least 7 cm. has to be made good. Acacia exerts approximately from 1.6 to 3.5 cm. pressure per gm. per 100 c.c. To be effective in *œdema*, a concentration of acacia of 2 to 3 per cent in the entire plasma volume is needed. On the assumption that the volume of plasma is 50 c.c. per kilo. of corrected body weight, 1 to 1.5 gm. of acacia per kilogram are necessary. The preparation used contains 30 per cent acacia with 4.5 per cent of sodium chloride and is diluted before injection with equal parts of distilled water. (Acacia preparations without salt tend to become toxic.) The injections are repeated at intervals of one to two days until diuresis occurs. The results have been good in 6 out of the 7 cases under observation. In the remaining case *œdema* was very severe and no diuresis followed. Recent observations show that when the initial plasma-albumin concentration is very low and *œdema* extensive, the administration of acacia is followed by an increase of blood-volume which dissipates the effect of the acacia.

Professor E. Schiff¹⁰ employs an unusual **Diet** in the treatment of *lipoid nephrosis* in children. The principal factor as a cause of death is secondary

infection, and treatment should therefore be directed to increasing the child's resistance, the reduction of œdema being subsidiary. A child must not be deprived of fat, which may well be given as lipid, the high lipid-content of the blood suggesting a 'lipoid-want'. The yolk of eggs is a suitable substance. The best diuretic is a large quantity of vegetable food. The patient commences on fresh fruit and vegetables, and diuresis commences in a few days. When the œdema diminishes, yolks of eggs, liver, and meat are added. The fluid intake is restricted to 60 to 100 c.c. of fruit-juice daily. Nine patients have been treated with good results.

REFERENCES.—¹*Special Report Series*, No. 178, Medical Research Council; ²*Amer. Jour. Med. Sci.*, 1933, June, 789; ³*Acta Med. Scand.* 1931, lxxiv, 479; ⁴*Lancet*, 1933, ii, 583; ⁵*Ibid.* 1932, ii, 60; ⁶*Jour. Biol. Chem.* 1932, xcvi, 519; ⁷*Lancet*, 1932, ii, 174; ⁸*Biochem. Jour.* 1932, xxvi, 917; ⁹*Jour. Amer. Med. Assoc.* 1933, c, 251; ¹⁰*Lancet*, 1932, ii, 1168; *Jahrb. f. Kinderheilk.* 1932, Oct., 1.

RENAL RICKETS FROM ACQUIRED NEPHRITIS.

Reginald Miller, M.D., F.R.C.P.

Renal rickets, although an uncommon condition, forms a well-recognized syndrome owing to the amount of study it has received in connection with the causation of rickets. The symptoms usually consist of polyuria, excessive thirst, anorexia, stunting and other bony deformities, of which knock-knee is usually the earliest. When the child is first seen there is usually evidence of chronic uræmia, and death is not commonly later than the second decade of life. In such cases as these there is usually a history dating from such early infancy that the causative interstitial nephritis may be regarded as congenital or arising very soon after birth. There is typically no history of any acute nephritis, and there are very few references in the literature to instances of renal rickets developing in cases of acquired nephritis.

Recently what seems to be an undoubted case of this type has been recorded by E. A. Cockayne and F. P. Lee Lander.¹ The patient was first seen at the age of 10 years for severe renal œdema. This appeared to be the onset of the nephritis. He was under observation until his death three and a half years later, and genu valgum, with radiological evidence of rickets at the knee and wrist joints, developed a little more than a year before death. This case seems clearly proved. The prolonged observation during life, the character of the kidneys at autopsy, and the fact that throughout the symptoms were of hydræmic type all confirm the authors' views.

V. H. Ellis² also reports two instances occurring after scarlatina in patients aged 14 and 17 years. As may be easily realized, not a few cases of renal rickets come under observation for the first time at an orthopaedic clinic, and Ellis makes the interesting remark that the condition may follow acquired nephritis or even chronic pyelonephritis. It is known to occur from congenital cystic kidneys. He admits, however, that owing presumably to the difficulty in the production of satisfactory proofs, there is little reference to such cases in the literature.

REFERENCES.—¹*Arch. of Dis. Childh.* 1932, vii, 321; ²*Ibid.* 1933, viii, 73.

RETENTION OF URINE, POST-OPERATIVE. (See BLADDER, SURGERY OF.)

RETINA, DETACHMENT OF. Sir Stewart Duke-Elder, M.D., F.R.C.S.

In the MEDICAL ANNUAL of last year (p. 401), a considerable amount of attention was paid to the modern treatment of detachment of the retina, and it was then pointed out that the original technique introduced by Gonin was being superseded by newer operations, such as that of multiple trephining and diathermy. This conclusion has been corroborated by the experience of several

writers during the past year, and considerably more valuable information regarding the value of these newer procedures and the results which may be expected from them is now to hand.

Multiple Trephining.—With regard to the operation of multiple trephining as described by G. Guist,¹ it is well to remember the following complications:—

1. Vitreous hæmorrhage, which may be very profuse, and is presumably due to perforation of a large choroidal vessel.

2. The development of post-operative uveitis which occasionally happens, which usually involves an increase in the detachment, probably owing to choroidal exudation.

3. The thrombosis of a vortex vein. This is due to trephining over a vortex vein and cauterizing it—an accident which can be avoided if a careful watch is kept that no large vein appears at the bottom of a trephine hole before the caustic is applied. This catastrophe is accompanied by intense congestion and chemosis of the eye associated with some pain, while the fundus presents an appearance resembling a large solid-looking detachment. Slow and slight improvement may occur, but the complication is a most unpleasant one. Fortunately most detachments occur anterior to the vortex veins, but their positions should be remembered. They lie within a zone 3 mm. wide and 18 to 21 mm. from the limbus, the superior temporal 7 mm., the superior nasal 8 mm., the inferior temporal 5 mm., and the inferior nasal 6 mm. behind the equator.

The results reported by this method of treatment have been good and compare well with those reported by Gonin. Some of them are shown in the following table:—

OBSERVER	CASES TREATED	REPORTED CURED	PERCENTAGE CURED
G. Guist (1932)	109	60	55
K. Lindner ² (1931)	19	13	68
G. W. Black ³ (Moorfields) (1932)	39	12	40
E. F. King ⁴ (Moorfields) (1933) ..	42	9	21
H. S. McKeown ⁵ (1933)	51	20	39

These results are in fact better than the actual figures would lead one to suppose, in so far as the operation has been tried (and gives occasional good results) in cases when ignipuncture would be ruled out because of the size or number of the holes which have been present. Thus in Guist's series there were 61 uncomplicated cases, of which 47 were cured (77 per cent); 11 cases complicated by iridocyclitis, retinitis proliferans, and vitreous hæmorrhages produced 2 cures. Of 24 cases which had previously been unsuccessfully operated on by ignipuncture, 6 were cured, 2 of which were of eight months' duration. In 13 aphacic eyes he obtained as high a percentage as 5 cures. In the Moorfields series several were well-nigh hopeless; and the 12 successes contained 3 which had proved failures with Gonin's method, and 4 which showed no visible hole in the retina. It is to be noted, however, that the second series operated on at Moorfields (by the same surgeons) was not nearly so good as the first.

The main advantages of the Guist method are: (1) It sometimes succeeds in old cases and in cases more severe than would justify the application of Gonin's method; (2) It allows multiple holes to be treated at one sitting; (3) It causes less damage to the retina; (4) It does not lead to the formation of traction strands; and (5) It does not require an exact but only an approximate localization of the retinal tear. On the other hand, it suffers from these

disadvantages: (1) It is extraordinarily tedious and time-consuming, usually occupying from one to three hours; (2) The risk of perforating the globe at the earlier stages of the operation is considerable, an accident which means its postponement; and (3) The occasional risk of hæmorrhage or extensive thrombosis if a large vessel is injured.

Diathermy.—The technique of the method of diathermy introduced by S. Larsson⁶ was fully described in the MEDICAL ANNUAL of last year (p. 403). Two further modifications have been introduced which deserve mention:—

1. *Closure of the Retinal Hole by Micro-punctures* (H. Weve,⁷ 1932).—While employing superficial diathermy somewhat after the manner of Larsson for detachments characterized by anterior dialyses, Weve employs a method when the hole is farther back which corresponds rather to the Gonin technique. The punctures are made by a fine diathermy needle, and the great advance in the technique is the possibility of operating under visual control. In his later work (1932) he discarded a bipolar diathermy machine and a relatively strong current of 50 ma., and used a unipolar electrode with a current of a few milliamperes only. A Zeiss contact glass is placed over the cornea, which keeps this tissue from drying and facilitates ophthalmoscopic examination. The tear in the retina is localized by his substitution method with the artificial eye (MEDICAL ANNUAL, 1932, p. 446), and a firm needle electrode is inserted through the sclera and retained from one to three seconds. The position of the scar is seen ophthalmoscopically as a white, fluffy, and very obvious area of coagulation, and its site relative to the tear in the retina is noted as a guide to further punctures. A series of punctures is made in this way until the entire margin of the tear is coagulated, a fundus examination being made after each. Inter-retinal fluid is lost slowly after each puncture, but as the live electrode sinks through the sclera with little or no pressure, the softening of the eye causes little inconvenience, and it must be ensured that at the end sufficient fluid has been evacuated to allow opposition of the retina to the choroid. The beautiful accuracy of this operation, and the ease and certainty with which any hole can be dealt with, is a considerable advance over Gonin's original procedure, but the introduction of the needle into the retina and vitreous induces more trauma than Larsson's procedure, which confines itself to surface action alone.

2. *Simultaneous Multiple Puncture* (K. Safer,⁸ 1932).—The essential feature of the technique evolved by Safer is to produce simultaneous multiple punctures surrounding the tear. To obtain this effect he uses special electrodes consisting of several needle points, or, as he calls them, 'nails', arranged on bars looking like small brushes on handles fitting into the electrode carrier. These needles are driven through the sclera, the bars being implanted one after the other in a ring round the retinal tear, or in a semicircular line round a dialysis; and these are not removed before the entire area is treated. This prevents escape of the vitreous and the collapse of the globe. The electrodes are then removed and the inter-retinal fluid oozes out, a procedure which may be facilitated by suction with a syringe with a blunt point. If the detachment is extensive, several perforations may be made in positions so as to produce several foci of choroidal coagulation, so that not only is the hole secluded but more widespread adhesions are inaugurated.

SURFACE DIATHERMY			CASES TREATED	REPORTED CURED	PERCENTAGE CURED
Larsson (1932)	..	..	40	20	50
Weve (1932)	..	..	23	11	48
King (Moorfields) (1933)	..	..	31	18	58

The results of treatment by diathermy have on the whole been better than by any other method, although as yet cases have been relatively few and almost entirely confined to the surface method. Some of these are given in the table on the preceding page.

The opportunities of obtaining eyes after these operations for histological section are rare, but a case has recently been reported by H. B. Stallard⁹ (1933) which died from pulmonary thrombosis nineteen days after a successful operation by surface diathermy. At the point touched by the electrode the sclera showed a zone of hyaline degeneration extending about $\frac{1}{2}$ mm. in depth: at no place was there any considerable tissue damage or necrosis. The choroid beneath the treated site showed aggregations of lymphocytes, plasma cells, and a few giant cells, while clumps of inflammatory cells had burst through Bruch's membrane and the retinal pigment epithelium, which, combined with aggregations of fibroblasts, assisted in forming adhesions between the choroid and the retina. The retina itself showed degeneration of the rods and cones over the area of coagulation, and its disorganized structure was infiltrated with fibroblasts and plasma cells, while clumps of large mononuclear leucocytes, polymorphs, lymphocytes, and strands of fibrin were present on the surface and in the structure of the vitreous body, which was drawn forwards and adhered to the retina and pars plana of the ciliary body at and near the site of the diathermy application. It is significant that the inflammatory response had extended into the iris and ciliary body and that the non-pigmented ciliary epithelium showed excessive proliferation, while fibroblasts were present in the circumlental space.

A very interesting *comparative histological study* has been reported by A. Mayer¹⁰ (1932) on the effects of the three operations under review. He induced an experimental detachment in rabbits mechanically, and treated different animals by ignipuncture, by trephining with potash cauterization, and by diathermy. He found that after the first two methods of treatment very extensive tissue destruction took place, which was more marked in the case of ignipuncture; when diathermy was used, however, this was much less extensive. In the study of his sections of all cases, the striking feature was the slightness of inflammatory changes, a finding which is well substantiated by clinical post-operative appearances. The histological picture is one of localized uveitis. Buds of granulation tissue herniate through Bruch's membrane, acting as grappling irons securing the detached retina to the choroid, a process which is eventually consolidated by choroido-retinal fibrous tissue adhesions. It is to be remembered, of course, that when this process is induced near the ora serrata, the immediate reaction produces a cyclitis, while an excessive amount of fibrous tissue formation in the circumlental space may not be altogether without future complications.

Unfortunately, at the moment, these procedures are too recent to allow any final verdict upon them: they are still in the experimental stage. As the position stands, it is probable that the ideal operation has not been devised. The impetus to new work which the initial success of Gonin's technique provided has not yet been expended, and further developments will without doubt arise.

REFERENCES.—¹*Klin. Monats. f. Augenheilk.*, 1932, lxxxviii, 810; ²*Arch. f. Ophthalmol.* 1931, cxvii, 177; ³*Trans. Ophthalmol. Soc. U.K.* 1932, lii, 486; ⁴*Brit. Jour. Ophthalmol.* 1933, xvii, 287; ⁵*Arch. f. Ophthalmol.* 1933, ix, 64; ⁶*Arch. f. Ophthalmol.* 1932, vii, 661; ⁷*Klin. Monats. f. Augenheilk.* 1931, lxxxvii, 145; ⁸*lxxxviii*, 812, 1932; ⁹*Ibid.* 1932, lxxxviii, 814; ¹⁰*Brit. Jour. Ophthalmol.* 1933, xvii, 294; ¹⁰*Arch. of Ophthalmol.* 1932, vii, 499.

RHEUMATIC DISORDERS, CHRONIC. *Vincent Coates, M.A., M.D.*

It is manifestly impossible to review the whole of the literature on such an enormous topic as that provided by chronic rheumatic disorders in general and to produce an intelligent summary thereon. A large number of references are given at the end, however, whereby the reader interested in any one particular subject may acquaint himself with the original article, and it is proposed to comment upon some of the outstanding occurrences from the rheumatic point of view which took place in the year ending July, 1933. These events are as follows:—

1. The International Rheumatic Congress in Paris, October, 1932.
2. The Report on the Strangeways Collection of Rheumatoid Joints in the Museum of the Royal College of Surgeons.
3. The Report of the Arthritic Committee of the British Medical Association.
4. The formation of a Rheumatic Committee by the Royal College of Physicians.

In addition it has been thought advisable to abstract two clinical papers which appear to the reviewer to stand out in merit above the others, the one in virtue of its clarity, arrangement, and dogma, and the other because of a pronouncement concerning fundamental treatment of joints which are the seat of arthritis. The papers referred to are those by Dr. C. W. Buckley, of Buxton, on 'Spondylitis', and Dr. H. Pern, of Australia, on 'Movement of Joints'.

The International Rheumatic Congress in Paris, October, 1932.—This was under the able presidency of Professor Bezançon, and was well attended by foreigners as well as by Frenchmen. In addition to papers there were demonstrations of arthritic cases at the Hôpital St. Antoine. In spite of the presence of many well-known contributors to rheumatic progress from other countries this international meeting was amazingly French in its outlook and technique. Many useful papers were read, but from the English point of view the two predominant features of the conference were the attitude of French observers as a whole towards rheumatoid arthritis and that towards 'rhumatisme tuberculeux'.

Rheumatoid arthritis is not universally accepted as an entity in France, and great pains were taken to ridicule the clinical conception of rheumatoid arthritis by the exhibition of various types of polyarthritis. The end-result having been reached in the majority of these cases, it is not a matter of surprise that it was found impossible to arrive at accurate data covering the progress of rheumatoid arthritis by the clinical demonstration of half a dozen crippled old women, in whom the predisposing etiological factors might have been anything from gonorrhœa to a street accident. On the other hand, from the English viewpoint, while it is impossible to ignore the existence of rheumatoid arthritis, it is as difficult to admit of the entity of tuberculous rheumatism as to conceive the occurrence of a blonde brunette or of a green lapis lazuli.

In France tradition perhaps influences medical matters more than it does in most countries, and there is always the French tendency in medicine to make what looks to be a straightforward affair a little more complicated than it really is. The French medical mind is so intuitive and so acute in its ability to pick out salient points and to form a brilliant hypothesis that it ill behoves any of us entirely to ignore 'rhumatisme tuberculeux' without investigating fully the possibility of such a condition, however certain we may be that it does not exist, in the same way that we hope that hardened French opinion will relax in the matter of rheumatoid arthritis.

It would be constructive, therefore, and the natural sequence of the Rheumatic Congress in Paris, that there should be an investigation into the possibility

of 'rhumatisme tuberculeux' in British spa hospitals to confirm or refute the theories of Poncet and his school and the bacteriological findings of Löwenstein; and that complementary to this investigation the French should undertake to establish a similar procedure in the case of rheumatoid arthritis.

The Report on the Strangeways Collection.—As an ex-pupil of the late Dr. S. T. P. Strangeways and as an occasional visitor to his 'human guinea-pigs' in the special hospital at Cambridge, the reviewer, with very pleasant memories of Mr. Lawford Knaggs' delightful and instructive book, *The Inflammatory and Toxic Diseases of Bone*, looked forward particularly to his report on the Strangeways Collection*. This report is contained in three parts and concerns itself with the description of 250 specimens of chronic arthritis and a large number of microscopical sections. It must be stated at the outset that the report is a very disappointing one. This in no way implies that the work has not been well done or that valuable additions to our knowledge have not been made. The reverse is true, but the histologist (as is also true of the biochemist and bacteriologist) can only report upon the material with which he is served. "The majority of the diseased joints were obtained from infirmary inmates who, in many instances, were advanced in years and hopelessly crippled . . . most of the specimens were the subject of advanced disease", and although "clinical notes were supplied with a large number of specimens", the notes of some of the histories quoted are scanty and misleading, and most of the sections concern cartilage and bone, as opposed to synovial membrane and capsule, which are presumably the first objectives of attack when the disease is in its active phase. It would be unreasonable, therefore, to expect a wholly satisfying report when, generally speaking, only the end-results have been investigated.

Part I of the report deals with the history of the Strangeways Collection, the correlation of osteo-arthritis, rheumatoid arthritis, and gout, and the contrast between bony and fibrous ankylosis. *Part II* deals with some natural features of the histological peculiarities of osteo-arthritis and rheumatoid arthritis. *Part III* concerns itself with the pathogenesis of gout, with the pathogenesis of Charcot's disease, and with a summary.

Part I.—At the outset Lawford Knaggs epitomizes the salient criteria distinguishing osteo-arthritis from rheumatoid arthritis, both clinically and pathologically. In a review of this type it will be unnecessary to discuss the clinical aspect of this matter. Knaggs states that he was unprepared for the frequency with which, in a collection of unselected cases, some of the special features of osteo-arthritis were associated with others peculiar to rheumatoid arthritis. He instances the following macroscopic phenomena: (1) Marginal lippling; (2) Eburnation; (3) Ankylosis. The difficulty of distinguishing osteo-arthritic from rheumatoid lesions in the material upon which research was undertaken was such that two knee-joints from the same individual are separately diagnosed by an authority on the subject, one as being rheumatoid and the other as being osteo-arthritic in character.

The final conclusion in this matter bears quotation: "The investigation of these intermediate cases in the Strangeways Collection has gradually led me to the belief that osteo-arthritis and rheumatoid arthritis are expressions—at opposite ends of the same scale—of a single disease, which I have reason to think is toxic in its origin. On this supposition osteo-arthritis and rheumatoid arthritis are not separate affections, but simply names by which two groups

*R. LAWFORD KNAGGS, "A Report on [the Strangeways Collection of Rheumatoid Joints in the Museum of the Royal College of Surgeons]", *Brit. Jour. Surg.*, 1932-33, xx, 113, 309, 425.

of characteristic pathological changes are distinguished. When the tissues are healthy and robust the toxic irritation acts as a stimulus to growth processes, and osteo-arthritis results. When the vitality of the tissues is poor, definite inflammatory reaction may be excited, and in the event of the tissues being unable to maintain their vitality in the face of such reaction, degeneration or even disintegration results. In either case rheumatoid arthritis develops."

The reviewer's opinion on what has gone before is to the effect that no clear decision can be arrived at concerning the whole pathological process evolved in the two conditions, rheumatoid arthritis and osteo-arthritis, by examination of material at its final histological stage. That is to say, examination of end-results without clinical data and without histological sections of the synovial membrane cannot help us to visualize the intermediate stages of the morbid processes. Moreover, it has been pointed out elsewhere by the reviewer that clinically and radiologically there are cases of 'mixed arthritis' and that these tend to vitiate both statistics and conclusions in the estimate of pure rheumatoid arthritis and pure hypertrophic osteo-arthritis.

A very valuable piece of work has been done when the fibrous and bony ankylosis in rheumatoid arthritis and the histological changes therein are compared. Knaggs discusses two groups of cases, in one of which *bony* ankylosis occurred. He explains that bony ankylosis as a rule begins with the fusion of granulation tissue springing from two opposing articular surfaces denuded of cartilage, and that into this area of fibrosing granulation tissue trabeculae advance from opposite sides and coalesce; that medullary spaces form and that there is ultimate fusion of the cancellous tissues and medulla of the separate bones. He considers that the absence of the unmistakable signs of inflammation—that is to say, migration of leucocytes—is due to the low-grade vitality of the tissues and that the onset of degeneration determines the fibrous form of ankylosis.

This explanation accounts for the radiological phenomenon of areas of degeneration in bone, sometimes mistaken for the potholes of gout. Further research is required into the why and the wherefore of inflammatory failure, in which disuse and calcium fatigue may be concerned.

Part II.—In this there is a careful and illuminating section on the histology of the osteophyte, dealing with its development and with the buried islands of articular cartilage. Knaggs next deals with degenerative changes of sclerosed and eburnated bones. He discusses the histology of these, and shows that the first change is the degeneration of small areas in the sclerosed substances. The group cells become conspicuous at sites where the bone looks granular and has lost its lamination. Later a space is formed which is filled with fibro-cellular tissue. The eburnated articular surface of macerated bones is often marked with small 'pits'. Microscopically these are not vascular apertures but small surface clefts filled with fibro-cellular tissue, the result of degeneration of bone. He states that rarefactive atrophy is frequently present in the hypertrophic forms of osteo-arthritic joints. The parts liable to degeneration especially are the eburnated and sclerosed areas—that is to say, the more recently formed bone.

This section helps us to understand the radiological pictures taken of hypertrophic osteo-arthritis in an advanced state.

In the section dealing with the histological findings in rheumatoid arthritis Knaggs makes the following statement: "The pathological process which is to be especially identified with rheumatoid arthritis is degeneration—a degeneration by which both articular cartilage and bone are replaced by fibrous tissue". At first sight this appears to be the most astounding announcement, but the sections showing the histology of fibrous degeneration of bone in

rheumatoid arthritis with the formation of spaces in the bone, the fibrous resolution of bone, and the fibrous resolution of cartilage thoroughly justify the assertion, *provided that we realize that Knaggs is not dealing with synovial membrane (the initial site of attack and of the infective process)*, but only with cartilage and bone presumably from cases in which either infection has died down in the soft tissues, or else in which there has been prolonged disuse.

Knaggs discusses the origin of giant cells associated with bone, and comes to the conclusion that in the fibrous degeneration which occurs in rheumatoid arthritis the disintegration of bone and cartilage is materially helped by their development. This section will interest French observers who tend to regard this form of arthritis as being due to an attenuated tuberculous infection.

Part II finishes with observations on specific forms of rheumatoid arthritis and Schüller's villous arthritis. In regard to the former, "these cases were marked by an illness of many years' duration, by painful chronic swellings of numerous joints, and by a crippled and bed-ridden condition, which terminated in death from exhaustion. In their clinical course they resembled, and were looked upon as, rheumatoid arthritis; but one was subsequently proved to be a pneumococcal infection; another was suspected to have been syphilitic (congenital) because of a general endo-arteritis affecting the synovial vessels; and of two others, one was due to the gonococcus and in the second a gonococcus was probably closely associated with the latter part of its course. Fibrous degeneration of bone, like that seen in rheumatoid arthritis, was found in all of them. The clinical course and histology justify these cases being regarded as rheumatoid arthritis due to specific cause—infection. The type is quite distinct from the well-recognized joint conditions commonly attributed to such infection; and the specific rheumatoid form may easily be distinguished by the use of the suitable adjective: e.g., pneumococcal, syphilitic, gonorrhoeal, rheumatoid arthritis".

This clinical conception, though attractive in theory, definitely does not hold water in practice; and it seems redundant to add to the difficulties which already exist in the clinical conception of rheumatoid arthritis.

The first case, one of so-called *pneumococcal rheumatoid arthritis*, appears to offer a history normal to a case of rheumatoid arthritis till the patient succumbed with symptoms of a right-sided pleurisy. At autopsy turbid green pus was found in the shoulder- and elbow-joints, and this was stated authoritatively to be undoubtedly pneumococcal. Knaggs adds the following: "The possibility that in this case the pneumococcal infection was superimposed on rheumatoid arthritis has to be taken into account". This is exactly what would appear to have happened, and at least one similar case has been seen by the reviewer in his practice.

The second case, labelled *syphilitic (congenital) rheumatoid arthritis*, is that of a young man who had his knee excised for a condition, thought to be tuberculous, of two years' standing. After discharge from hospital all his joints became affected, and in due course he was completely crippled with pain, swelling, and stiffness. He eventually died from exhaustion caused by bed-sores following pneumonia. Spirochetes and tubercle bacilli were not found, and the diagnosis was based upon the histological findings of endo-arteritis of the vessels in the thickened synovial membrane. These were very numerous.

It is impossible to be dogmatic in this particular case, but the criticisms are as follows: (1) Apparently nothing of the nature of syphilis in the bones apart from the joints was noted. Not only is this unusual but many syphilitic joints are a direct extension from neighbouring bone. (2) No gummata were noted in the synovial membrane. (3) Endo-arteritis and increase in the number of

capillaries are characteristic of the synovial membrane in every-day rheumatoid arthritis.

The third and fourth cases were those of men both of whom had a multiple arthritis. In one gonococci were found in the capsule of the knee-joint post mortem, and in the other doubtful gonococci were reported in the capsule of the knee-joint; but both had had rheumatic fever, the first case on two occasions subsequent to gonorrhœa, the second prior to gonorrhœa. Clinically it is not uncommon to find that rheumatic fever or rheumatoid arthritis prepares the way for the establishment of gonococci in the joints, and the reviewer has seen a good many cases in which both rheumatic fever and gonorrhœa were the precursors of rheumatoid arthritis.

Max Schüller described a type of villous reaction in a joint as "inflammatory hyperplasia of the normal synovial processes as they occur in chronically inflamed synovial membranes". The section shown was removed at biopsy from the knee of a lorry driver and was diagnosed by Dr. Strangeways himself as Schüller's villous arthritis. It is not agreed at the moment, however, that such a clinical entity exists; the general feeling nowadays being that a villous reaction may occur in response to trauma, infection, and degenerative stimuli, so that comment is superfluous.

Part III.—Knaggs has reported shortly on the arthritic phenomena associated with gout and the microscopical characteristics of the gouty deposit, but this will not be commented upon as it is not germane to a rheumatic review. He has a very interesting section on the pathogenesis of Charcot's disease. The following quotations are selected from his remarks on the histology: "The description of the histology of Charcot's joints would, for the most part, be simply a repetition of the account of the degenerative changes in rheumatoid arthritis . . . but there is this difference in Charcot's disease—the degenerative changes are more pronounced and more widely spread. Not only are large blocks (microscopical) of fibrous tissue seen in places that have previously been occupied by bone or cartilage, but the evidence of degeneration and resolution extends to much greater depths. Indeed, degeneration sometimes seems to take place *en masse*. . . . It has long been recognized that the extensive destruction which takes place in Charcot's joints is induced by the withdrawal of a trophic function. This is an acknowledgement of the part that vitality of the articular surfaces plays in this affection. The similarity of the microscopical changes suggests that the only etiological difference between rheumatoid arthritis and Charcot's disease is that in the latter innervation of the joint has been impaired. The much greater destruction in the case of the Charcot's joint may be explained by the more extensive degeneration, and by the absence of pain permitting free movement."

Here, again, it must be remembered that the author is considering only articular cartilage and bone and not synovial membrane. There is a very able comment on osteophytes in Charcot's disease; to quote again: "It was the remarkable development of osteophytes that caused the early controversy as to the nature of Charcot's joints, and furnished the best argument for those who regarded the affection as osteo-arthritis in a tabetic. But the formation of osteophytes seems incompatible with the rapid degeneration of the articular bone and cartilage which takes place in this case. There are, however, two kinds of osteophytes—those growing in connection with the articular cartilage and those forming in the capsule. The latter are numerous in Charcot's disease, and as they have a different mode of origin from articular or marginal osteophytes, the incompatibility just mentioned may be capable of explanation". Knaggs adduces evidence which is "opposed to the idea that articular osteophytes are common in Charcot's joints; and it is difficult to avoid the

conclusion that the osteophytes usually met with in such cases are of capsular formation . . . marginal osteophytes of the ordinary type met with in definite neuropathic joints are almost certainly of pre-Charcot development. They will probably show degenerative changes resulting from the tabetic affection”.

Report of the British Medical Association Committee on the Causation and Treatment of Arthritis and Allied Conditions.—This is a report of some twenty pages by the Committee set up by the Council of the British Medical Association on Nov. 11, 1931, for the following purposes:—

1. To correlate the present knowledge of chronic arthritis and allied conditions.

2. To report on the methods at present in use, and the organizations at present existing, both at home and abroad, for the treatment of these conditions.

3. To report on the directions in which future research into these conditions can be undertaken with most probable profit, and the means whereby such researches may be directed and correlated.

4. To report on the means whereby a knowledge as to early diagnosis, prevention, and treatment of these conditions may best be disseminated amongst the medical profession.

Opinions on this report will naturally differ according to the standard of knowledge of the individual reader. Certainly as a rechauffé of current literature the general practitioner is provided with a varied repast, and the Committee are to be congratulated upon obtaining a uniform consensus of opinion in seventeen of its members whose interests are so widely divergent, and it is a matter of satisfaction that errors both of omission and commission are not promulgated to a greater degree. *It is a matter of regret, however, that the marshalling of knowledge from text-books and articles does not result in an authoritative emphasis of the essential as opposed to the trivial.* Those who are dealing with rheumatic problems in every-day life are capable of forming a reasonable estimate of what is important and of what is not, but little, if any, help is offered in the matter of fundamental principles to the individual who meets with, say, a case of rheumatoid arthritis only occasionally in his practice. As an example—while there is a very able section on orthopædic treatment, the fact that the treatment of the joints themselves in *every* case of rheumatoid arthritis should be orthopædic from the word ‘go’ is not underlined.

Space precludes the discussion of each section seriatim, but a word is advisable on nomenclature and classification. It is stated that an etiological classification in the present state of knowledge is impossible, and that “the Committee has adopted as the most practical solution a clinical grouping”. It describes rheumatoid arthritis, primary and secondary, chronic villous arthritis, osteo-arthritis, spondylitis, and fibrositis. To the reviewer’s mind this is unfortunate, as the classification of *arthritis* on an etiological basis, advocated by him and gradually gaining support, especially in America, has many advantages, the most obvious being that a classification of *chronic rheumatic disorders* can be grouped under the same headings: infective, metabolic, degenerative, neuropathic, and mixed.

The first item is *rheumatoid arthritis*, primary and secondary. If it were possible to differentiate clinically between the primary and secondary rheumatoid arthritis as described by the Committee, then the secondary rheumatoid arthritis is what has been described elsewhere as ‘focal’ arthritis—“that type of arthritis responding immediately and completely to removal of sepsis making its appearance just prior to arthritic symptoms”, an exceedingly rare phenomenon, as every clinician knows.

Chronic villous arthritis: Many observers would not admit that chronic villous arthritis is a diagnosis, as a villous reaction may be evoked by infection, wear and tear, disordered metabolism, and trauma, and as such should be regarded merely as a short halt during a pathological march.

The section on *spondylitis*, though short, is very much to the point, and if not written by Dr. Buckley it was obviously inspired by his articles (*see below*).

Fibrositis is described as an "inflammation of the connective tissues of the body". While this may be true of the initial stage of a morbid process, it is a fact that the symptoms usually complained of by patients are referable to some fresh disturbance (traumatic, metabolic, or infective) occurring in fibrous tissues no longer the seat of the original active inflammation—in other words, in scar tissue.

The note on *panniculitis* is disappointing, as the opportunity for emphasizing a very common, though frequently unrecognized, complaint, and for stressing appropriate and efficacious treatment, has been lost.

In regard to *diet* it is stated that there is a great diversity of opinion and error is very prevalent. "In rheumatoid conditions the first essential is an adequate supply of simple digestible food and there is no justification for forbidding any article of food which the patient finds easy to digest and to which he offers no idiosyncrasy . . . thus the diet in rheumatoid arthritis should include milk, butter, eggs, fish, and meat of digestible kinds including liver and some fat; wholemeal bread, yeast extracts, fresh fruits, and vegetables (raw and cooked), including peas, beans, lentils and, when in season, young carrots and turnips. Foods outside this list are not necessarily prohibited and may be taken to gratify taste or appetite so long as adequate amounts of the more important foods are included". Actually in practice there are several principles which should be obeyed in the matter of diet in rheumatoid arthritis. In the first place, the integrity of the metabolism of digestion in rheumatoid arthritis is not constant. Biochemical examination of the stools and urine will show that not only do cases vary in their ability to combust and assimilate carbohydrate, protein, and fat, but that individual cases vary at the different stages of the disease. It is thus impossible to lay down other than generalizations without adequate biochemical aid. In the main, however, it can be said that a high calorie diet, including roots rich in vitamins, is useful in the exhausting early months of the disease, provided that this diet is not too prolonged. In the later stages of the disease, when panniculitis and adiposity are apt to occur, carbohydrates will have to be restricted to prevent obesity.

In the section on *physical treatment by baths* it is regrettable that one of the contra-indications to spa treatment is stated to be arthritis in the acute stage, and also that deep bath and pool bath treatment is not more emphasized. At the Royal Mineral Water Hospital in Bath the judicious use of pool baths has been found most valuable towards the prevention of fixation of joints in rheumatoid arthritis and in spondylitis even in their very acute phase; and the results of active movements in a deep bath and assisted movements in a pool bath in cases of hypertrophic osteo-arthritis⁵ of the hip are almost proverbial.

The Formation of a Rheumatic Committee by the Royal College of Physicians.—The International League against Rheumatism (Ligue Internationale contre le Rhumatisme) is composed, as its name implies, of those who are especially interested in the study of rheumatic disorders. Each country has a national committee, representatives of which meet those of other countries to determine the policy of the League, the official organ of

which is the *Acta Rheumatologica*. Up to date there has been no authoritative British Committee, but the formation of this is almost an accomplished fact. It is hoped that the Royal College of Physicians at their next comitia will allow the committee which has already met to carry its authority, and that this committee will not only afford a lively liaison with the other units of the League against rheumatism, but will also plan systematic research in England.

Spondylitis Deformans.—Those particularly interested in the subject of spondylitis are advised to read the article by Dr. C. W. Buckley, published in the *Proceedings of the Royal Society of Medicine*, in the section on Physical Medicine, in December, 1932, p. 105. The author dissects the two principal types of spondylitis—namely, spondylitis ankylopoietica and spondylitis arthritica—from the other members of the spondylitis group. He advocates, for the future, relegation to these categories of the types described severally by Strümpell, Marie, and Bechterew—first on the grounds that credit should be given to an Englishman who was the first to describe the disease (Bernard Connor, in the *Philosophical Transactions* of 1700), and, secondly, because the types described by subsequent writers on the subject overlap each other in measure. He does agree, however, that there may be a distinct form intermediate between the two main groups of spondylitis referred to, a view advanced by Leri, to which the reviewer's clinical experience subscribes. Several paragraphs from this article bear quotation *in extenso* :—

"*Ankylosing spondylitis* is a disease of young adults, chiefly males. Its onset is insidious, generally with slight pyrexia and some failure of general health, and stiffness of the back, steadily increasing and spreading in a centrifugal manner to the large joints. It begins most frequently in the lumbar region, but in a small proportion the cervical spine is first attacked. The sacro-iliac joints are implicated almost from the first in those cases in which it starts in the lumbar region, and the costovertebral joints are also early attacked, so that breathing becomes entirely abdominal. The hips, shoulders, sternoclavicular and mandibular joints are affected in turn. In two of my cases of spondylitis, in which the wrists, hands, and feet were the seat of arthritis there was reason to think that this was due to a distinct disease process. The occipito-atlantoid and atlanto-axial joints often escape, so that the power of rotating the head is retained when all other movement of the spine has been lost. The amount of pain varies, and it is sometimes absent altogether. The earliest change to be detected radiologically is rarefaction of the vertebral bodies, but in a skiagram taken in three-quarter lateral position which will show the joints of the articular process, it will be seen that changes are present there at an early stage, the margins of the joints being ill-defined and the joint space being diminished, the process going on to complete obliteration. The appearance of the hip-joints when the disease has spread to them shows clearly that the cartilage undergoes destructive changes at an early stage.

"Side by side with the rarefying process, ossification takes place in the ligaments and outer fibrous portion of the intervertebral discs, but the nucleus pulposus appears always to escape. Ossification of the anterior common ligament often occurs, but it is not a constant or distinctive feature as would appear from some descriptions. It is merely part of the process affecting all the fibrous and ligamentous structures, and is most marked where there is most strain. The lumen of the spinal canal and the neural canals and foramina are not encroached upon.

"As the active disease subsides, the calcium metabolism improves and the density of the bones may return to normal. The disease may become arrested at any stage, and the early and incomplete forms are often difficult of diagnosis.

The rarefaction or osteoporosis of the vertebral bodies is responsible for the curvatures which are apt to develop. The softness and fragility of the bones was first described by Hilton Fagge. If the patient is kept in bed, ankylosis takes place with the spine straight, the lumbar concavity flattening somewhat, but if he gets about to any extent, all the curves tend to be exaggerated; lumbar lordosis is, however, less marked than the dorsal kyphosis, and this tends to cause hyper-extension of the cervical region and head. The lumbar bodies become compressed, constricted at their middles, and spread at the upper and lower surfaces, producing a characteristic bamboo-like appearance in the skiagram, the discs retaining their normal thickness. The dorsal kyphosis results in a thinning of the anterior aspect of the bodies, and a compression of the discs, which tend to become lenticular, but this process is checked by the rapid extension of the ossifying process to the discs. The intervertebral joints undergo early ankylosis, with ossification of the capsular ligaments, and the joint ceases to exist. This produces a tram-like appearance in the skiagram, owing to the density of the new bone formation compared with the rarefaction of the bodies. Ossification of the interspinous ligaments in a similar way produces sometimes the appearance of a central line of greater density.

"The ossification of the outer portions of the vertebral discs produces an appearance of linking together by bony bridges, but it is essential to note that these are not osteophytic outgrowths like those met with in spondylitis osteoarthritica, but totally different in etiology. In the latter condition the linking of the vertebral bodies, when it occurs, is due to a process of synostosis between contiguous osteophytes, but, in ankylosing spondylitis, to ossification extending into existing structures. It must be emphasized that osteophytes do not occur in ankylosing spondylitis. A striking feature in many skiagrams is periosteal thickening and new bone formation, especially along the ischial and pubic rami. This is seen in other conditions of bone softening with subsequent compensatory bony changes, especially in osteitis deformans and late rickets. Its occurrence sheds some light on the pathology of the characteristic bony changes in the spine, and it is probably a process of reinforcement of the softened bones to withstand the pull of the powerful thigh muscles.

"There is an increase of phosphatase enzyme in the blood, in the acute cases, though not to a very marked extent—up to 0.36, compared with a maximum in normal individuals of 0.20. This is in contrast with atrophic and hypertrophic arthritis, in neither of which has any increase been found, and the same applies to spondylitis osteoarthritica. Much confusion has arisen from the assumption that this form of spondylitis is identical in its pathology with infective or atrophic arthritis. There is no proof of this, and I believe that the two conditions are distinct diseases."

TREATMENT.—In regard to the treatment of the ankylosing form of spondylitis the objectives are: "(1) To hyper-extend the spine. (2) To mobilize the thorax. (3) To mobilize the hips and shoulders. (4) To regain the movements of the head, especially rotation. (5) To improve posture.

"In the active stage of the disease the patient is kept lying in a plaster shell with the spine in slight extension, and respiratory exercises are given in this position. A new plaster shell with increased hyper-extension is usually required about once in three weeks. In old cases, with deformity and no active disease, a hyper-extension shell is used at night, and a spinal support is worn by day. Hyper-extension and breathing exercises are carried out while the patient is wearing a broad firm belt to discourage abdominal movements and to further those of the thorax".

This method of treatment is far in advance of the standard treatment usually adopted—namely, to aid ankylosis in an optimum position by complete rest.

Still better results can be obtained by under-water manipulative treatment as practised in Bath in combination with the methods advocated above. The patient, while lying in a sling submerged in natural mineral water at 104°, has his joints moved by a manipulator. Breathing exercises, both active and assisted (as in artificial respiration), are also carried out. These are instituted even in the acute stage of the disease.

The Treatment of Joint Lesions of Arthritis Deformans.—This paper by Dr. H. Pern should also be read in its entirety. It is published in the *Medical Journal of Australia*, May, 1933, p. 573. Those who have had extensive and long-standing experience may not agree with all that Pern says, but his methods of treating the joints in rheumatoid arthritis are more than worth a trial in spa hospitals where there is an aggregate of cases of this type, and the fundamental principles laid down by him should in great measure replace the average practitioner's view that joints in rheumatoid arthritis should be kept on the move all the time. He says, "arthritis will not be cured either by removing a septic focus or by raising the immunity, simply because joints act mechanically". In discussing whether the joints in rheumatoid arthritis should be moved or rested, he states, "workers are divided into different schools, one school using rest, another mobility, and another a combination of the two. . . . Physiologically a joint is the fulcrum in a system of levers, so if the mechanism of the fulcrum is altered from any cause, the mechanism of the system of levers must also be altered. The correct working of that fulcrum depends on the joint proper, on the structures which are used in its function, and on proper guidance by brain and nervous system. . . . The subacute or chronic stage was reached as a result of the continuation of inflammation, set up either by the primary cause or by the incorrect use of rest or mobility."

During the subacute stage of rheumatoid arthritis, "if active movements are performed, the joint is used mechanically incorrectly, further inflammation and a vicious circle being set up; passive movements, if performed incorrectly, do the same thing; even if performed correctly they may set up inflammation. Complete rest will only produce denser adhesions . . . so all three forces used separately cannot cure the condition of the joint. The only way to bring about cure is to use all three forces at the same time correctly; rest to relieve inflammation, passive movement to restore the joint so that it is capable of performing its function, active movements to consolidate each step in treatment and finally for the correct performance of that function: all three factors assisting Nature to repair damaged structures."

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RINGWORM. (See SKIN, FUNGUS AFFECTIONS OF.)

ROSACEA. (*Plate XLV.*) *A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*

S. Ayres, jun., and N. P. Anderson¹ put forward the view that the papules and pustules found in acne rosacea are due to the activity of the *Demodex folliculorum*, a small acarus (similar to that found in follicular mange of dogs) which has been known for many years to occur in the sebaceous follicles of the face, chest, and back, and has been thought to be purely saprophytic. The authors have previously described a dry, scaly condition of the face which they believe to be produced by this mite and to which they have given the name 'pityriasis folliculorum (Demodex)'. H. Lawrence and later A. Whitfield have thought that this mite could produce a type of impetigo. Ayres and Anderson describe 63 cases of acne rosacea in 50 of which the organism was found in the pus from the lesions. In all cases excellent therapeutic results were obtained by the use of strong **Antiparasitic Ointment** without any other treatment. They have used an ointment composed of β -naphthol, 2 parts; sublimed sulphur, 4 parts; balsam of Peru, 15 parts; soft paraffin, 15 parts. More recently they have tried **Danish Ointment** (used in the treatment of scabies) and find it causes less irritation.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1933, March 4, 645.

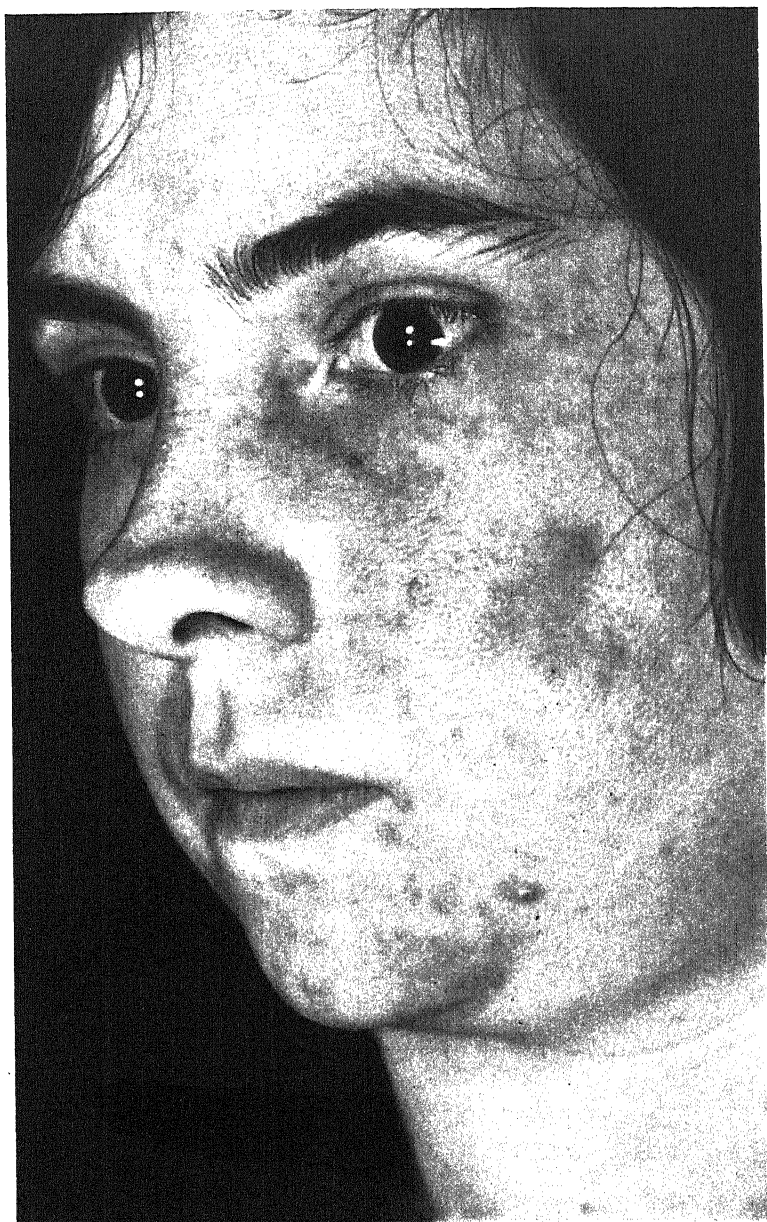
RUBELLA.*J. D. Rolleston, M.D., F.R.C.P.*

SYMPTOMS AND COMPLICATIONS.—W. Gunn¹ records a case of rubella complicated by *purpura hæmorrhagica*. The patient was a girl, aged 9½ years, who had been subject to mild attacks of epistaxis since the age of 5 years. Her mother had also had similar attacks from her eighth to fourteenth year, but the rest of the family, consisting of the father, three brothers, and a sister, had never had epistaxis or other hæmorrhagic symptoms. On the third day of disease petechiæ appeared in each supraclavicular and antecubital fossa and were followed by profuse epistaxis. In the onset of the purpuric manifestations directly after the decline of the rubella rash, thrombocytopenia, normal plasma calcium content, and prolonged bleeding time, the case was almost identical with that reported in 1929 by Pitten, the only other example on record of rubella complicated by *purpura hæmorrhagica*. Recovery followed intramuscular injection of 20 c.c. of **Hæmoplastin**, followed a few hours later by 50 c.c. of the mother's **Whole Blood**.

Two cases of *encephalitis* following rubella are recorded by J. Siegl² and K. Motzfeldt³ respectively. Siegl's patient was a girl, aged 9½ years, who on the fifth day of an ordinary attack of rubella when all the symptoms had disappeared, developed typical symptoms of encephalitis. Complete recovery took place in a few days. Motzfeldt's patient was a girl, aged 14 years, who suddenly developed coma, hyperpyrexia, and athetotic movements of all four limbs four days after the appearance of the eruption. Death took place in twenty-four hours. The necropsy showed a generalized inflammation of the brain, and on histological examination the appearances were similar to those of encephalitis following measles. This appears to be the first fatal case on record of encephalitis following rubella. (*See also* MEDICAL ANNUAL, 1931, p. 420; 1932, p. 463.)

In contrast with measles, in which a previously positive *tuberculin reaction* usually becomes negative during the eruptive period, in rubella the reaction is not usually affected. During a recent epidemic of rubella, however, H. Koch⁴ saw a boy, aged 3½ years, admitted to hospital with hilus tuberculosis and a strongly positive Pirquet reaction which became negative during the eruptive period of an unusually severe attack of rubella. Measles could be excluded by the history of a previous attack, the typical character of the rash, and the glandular enlargement. The disappearance of the reaction is attributed to

PLATE XLV—ROSACEA
(HENRY C. SEMON AND ARNOLD MORITZ)

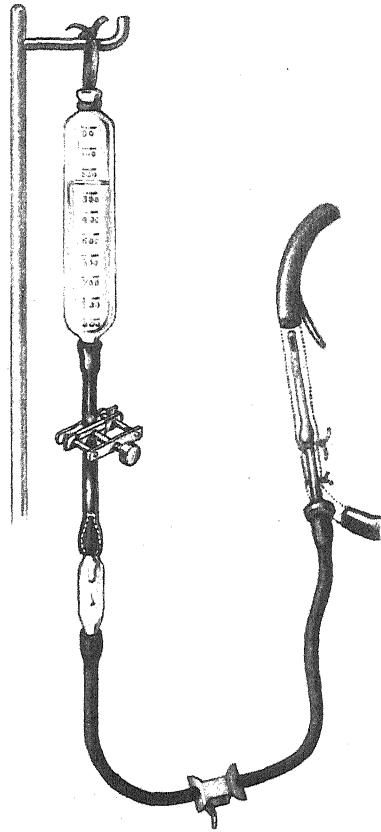


*By kind permission of
Dr. Henry C. Semon and Dr. Arnold Moritz*

PLATE XLVI

CONTINUOUS INTRAVENOUS SALINE

(F. B. RAMSAY)



Apparatus for administering continuous intravenous saline.

the unusual severity of the eruption by Koch, who alludes to attenuated cases of measles in which, as in most cases of rubella, the reaction does not become negative.

REFERENCES.—¹*Brit. Jour. Child. Dis.* 1933, 111; ²*Arch. f. Kinderheilk.* 1932, xcvii, 235; ³*Norsk Mag. f. Laegevid.* 1933, 153; ⁴*Wien. med. Woch.* 1932, Nov. 5, 1397.

SALINE, CONTINUOUS INTRAVENOUS. *Hamilton Bailey, F.R.C.S.*

In oliguria and anuria it has been customary to advise, amongst other therapeutic measures, hot packs. These are singularly ineffective, if not actually harmful. H. Cabot¹ insists that sweating is of absolutely no value in eliminating nitrogenous waste; it depletes the body of much needed water and salts, and it exhausts the patient by interfering with the regulation of heat.

When it is necessary to stimulate the kidneys to physiological activity there is no better method than the introduction of saline, or saline and glucose, intravenously. If the patient is profoundly uræmic, venesection should precede the glucose-saline infusion (H. Bailey²). For administering saline when it is imperatively necessary the intravenous route appears, at first sight, to be ideal. Nevertheless until a few months ago the reviewer preferred to employ the subcutaneous route, or proctoclysis, in most instances, for the following reason: It is manifestly unphysiological to put into the circulation a pint or more of fluid comparatively suddenly. This theory is borne out in practice. A common experience after the administration of intravenous saline to a collapsed patient is that a wonderful improvement in the volume of the pulse is soon noted; all in attendance are delighted. Too often one returns in a couple of hours to find that the heart and lungs have become embarrassed, which is what might be expected after having suddenly, or comparatively suddenly, overtaxed the vascular system.

The *continuous* introduction of saline or saline and glucose over a period of many hours, or if need be many days, is now possible, and it promises to become a form of therapeutics capable of tremendous application. In every case where it is essential for the patient to have saline the intravenous route may now be chosen with confidence. The uncertainty of the amount absorbed which obtains when other routes are used is obviated. Continuous intravenous medication is likely to come into general use, and it may well prove to be one of the greatest advances of the last few years.

Technique.—This is simple. Under local anaesthesia Hendon's gold-plated needle, or one of its modifications, is tied into a vein of the lower extremity below the knee. At the time of the introduction the needle and the wound should be moist with citrate solution. The limb is placed upon a back splint and the simple apparatus shown in *Plate XLVI* is rigged up. Saline is poured into the flask at a temperature of 105° F., but it is unnecessary to be concerned about the temperature of fluid which enters the vein. The amount of fluid to be administered can be regulated to a nicety. One simply has to state the rate of flow, which should be, say, half a pint an hour.

It is essential to have a special nurse to watch constantly and regulate the apparatus, and above all to see that the flask is never for a moment left empty. Every patient who is ill enough to require intravenous saline should be entitled to a special nurse in any case.

If it is desirable to administer intravenous medication, the appropriate dose is mixed with the saline to be poured into the flask. Should the patient require a blood transfusion, the blood is admixed with the saline, and that too enters the circulation. (F. B. Ramsey.³)

REFERENCES.—¹*Proc. Mayo Clinic*, 1932, June 7; ²*Practitioner*, 1933, March, 342
³*Surg. Clin. N. Amer.* 1933, June, 631.

SALIVARY CALCULI.*Sir W. I. de C. Wheeler, F.R.C.S.I.*

The etiology of calculus formation, whether it be in the gall-bladder, kidneys, or salivary glands, is obscure. In the case of the last, it is interesting to note that, although the parotid gland is frequently the site of inflammation, the formation of stone is infrequent. Many cases of salivary calculi appear to be associated with the infection of actinomycosis. Lime salts are precipitated and deposited round the colonies of the organisms. In a great majority of cases salivary calculi are found in the submaxillary gland or duct. X rays will demonstrate the stones in most cases, but the symptoms and signs usually make this method of examination unnecessary. When Wharton's duct is obstructed the corresponding gland is swollen and tender but the overlying skin is free. There is no trismus, but pain in the gland is well-marked, especially before taking food. Pus may be seen exuding from the orifice of the duct under the tongue. The calculus is often felt in the floor of the mouth.

R. H. Ivy and L. Curtis¹ discuss salivary calculi. They draw attention to the mild or subacute recurrent cases in which the true condition may be overlooked. Redness or swelling is often seen round the orifice of a suspected duct. X-ray examination is valuable in such cases. They give in detail the correct method of taking the photograph. The ordinary external film of the lower jaw region will frequently fail to show a small stone situated in the anterior part of the duct, as the stone shadow may be hidden by that of the mandible. Where a calculus is suspected in the anterior two-thirds of Wharton's duct, a No. 2 film ($2\frac{1}{2}$ by $3\frac{1}{2}$ in.) is placed in the occlusal plane between the upper and lower teeth as far back in the mouth as possible with the sensitive side down, and the patient instructed to bite on it. The rays are directed from beneath the chin. This will give a clear shadow of any opaque substance in the floor of the mouth. If the stone is farther back, near the beginning of the duct, a lateral extra-oral film may be necessary to show it. Multiple calculi may be shown by X rays, when unsuspected clinically—a fact which has an important bearing on treatment, so that even though a positive diagnosis has been made clinically, X-ray examination should not be neglected for this reason.

Obstructive enlargement of the submaxillary gland is commonly mistaken for a lymphadenitis or cellulitis due to infection from teeth or tonsils. The absence of trismus is significant in making differential diagnosis. The cystic swelling of the floor of the mouth may be due to a calculus lodged in the duct of the submaxillary gland and must not be confused with ranula. The latter is never associated with a calculus. In cases of ranula the submaxillary duct can usually be identified and isolated completely from the cystic swelling.

TREATMENT.—If the stone is in the anterior two-thirds of Wharton's duct, it is removed by an incision through the mucous membrane of the floor of the mouth under local anaesthesia. The reviewer introduces local anaesthetic through a dental needle under the mucous membrane. A bloodless incision can be made, and unless the stone is small and movable it is easily extracted. Ivy and Curtis recommend the injection of the lingual nerve as in the mandibular injection for the extraction of teeth. When the calculus lies at the junction of the duct with the gland its removal by external incision is indicated. In such a case removal of the gland as well as the stone is advisable. In most cases of parotid calculi the stone can be removed from the duct through the mouth.

REFERENCE.—¹*Ann. of Surg.* 1932, Dec., 979.

SCARLET FEVER.*J. D. Rolleston, M.D., F.R.C.P.*

EPIDEMIOLOGY.—H. M. Woods¹ points out that the deaths from scarlet fever in England and Wales have shown such a remarkable diminution due to lessened severity of the disease as to suggest that the lowest death-rate has been reached.

It should be borne in mind, however, that a change in intensity from extreme gravity at the end of the eighteenth century to a mild type at the beginning of the nineteenth was followed by a severe type in the fifties. Comparison of the rates in London with those in Liverpool, Manchester, and Birmingham, shows that the change in the trend of scarlet fever mortality has not been uniform, but has presented more or less considerable variations. There does not appear to be any evidence that hospital isolation has had any effect in reducing the prevalence or mortality of the disease. Among the factors responsible for the spread of scarlet fever poverty and low rainfall have been incriminated. It is true that in London scarlet fever is more prevalent in the poorer and more crowded areas, but in Birmingham the highest incidence is among the better-class artisans, and in Glasgow the attack rate has decreased as crowding increased. The relationship shown by Longstaff in 1880 and by Brownlee in 1923 to exist in London between wet years and low prevalence of scarlet fever does not hold good in Liverpool, Manchester, or Birmingham. As regards age distribution, the absolute mortality has fallen at every age, but there has been an increase in the relative mortality in later life. In spite of the considerable decline in the mortality of scarlet fever in the last thirty years there is no evidence that its prevalence has diminished to any extent. As regards the geographical distribution, there is a high incidence in London and Essex, while in Middlesex, Bedfordshire, Wiltshire, and Denbigh, the attack rates exceed 2500 per million population. On the other hand, the epidemic of 1920-1 was followed by a marked fall in the attack rate in Wales, where in 1930 it was 2.87 as compared with 4.35 per 1000 in 1920. In London (1930-1) and in Manchester (1896-1929) the highest attack rate was at the age of 5 years, when school attendance becomes compulsory.

N. D. Cernozubov² reports that the severe epidemic of scarlet fever in Yugoslavia in 1928-9 was preceded by mild outbreaks in 1927 and 1928 in which there were no deaths but numerous abortive or atypical cases. In the autumn of 1928 a violent outbreak suddenly occurred, reaching its height in December. The case fatality was 34.7 per cent in 1928-9 and fell to 26.3 per cent in 1929-30; 7.8 per cent of the patients had hypertoxic or fulminant attacks. The high death-rate was mainly due to the epidemic attacking virgin soil. Active immunization yielded unsatisfactory results, as the disease claimed many victims in the schools where the children had received prophylactic injections of Dick toxin and anatoxin.

BACTERIOLOGY.—T. Toyoda and Y. Futagi,³ of the Japanese Government Isolation Hospital at Darien, Manchuria, like Bürgers and Meyers in Germany in 1924, carried out experiments which refuted Di Cristina's theory of a filtrable microbe being the causal agent of scarlet fever. As regards the question whether any other factor than streptococci was needed in the etiology of scarlet fever, Toyoda and Futagi failed to discover the filtrable micro-organism described by Zlatogoroff or the diphtheroid bacillus of Mandelbaum which these workers regarded as activators of streptococci in the causation of scarlet fever. Toyoda and Futagi conclude that there is no necessity to regard any other organisms than hemolytic streptococci as the cause of scarlet fever.

SYMPTOMS AND COMPLICATIONS.—A. Stroë and A. Brüll⁴ record six cases of *appyrexial scarlet fever*, which was first described by Barthez and Rilliet and Fiessinger and Oyonax, but has recently received little attention. Some of the cases had had a previous attack of scarlet fever or had undergone active immunization, while others neither had had scarlet fever before nor had been actively immunized. The attack in each case was very mild. The throat was injected but painless, while the eruption and desquamation were typical. There was no constitutional disturbance and the temperature remained normal during the

eruptive stage. Two patients, however, on the eighteenth and twentieth days respectively had a slight rise of temperature and transient albuminuria; apart from an eosinophilia of 6 to 8 per cent the blood-picture was normal in all cases.

I. Reidermann,⁵ who records three personal cases, states that the frequency of relapses in scarlet fever ranges from 0.42 to 6.83 per cent. His cases occurred in children aged $5\frac{1}{2}$, 7, and $2\frac{1}{2}$ years, in whom there was a return of all the initial symptoms on the fifteenth, seventeenth, and twenty-second days respectively of an undoubted attack of scarlet fever. In all three cases the first attack was followed by desquamation, and two patients developed typical complications, such as arthritis, cervical adenitis, and otitis. All three children had been isolated, so that external sources of infection could be excluded.

In a note on scarlet fever following operations on the nasopharynx, A. Joe⁶ states that of 32 cases of scarlet fever after operations 19 occurred after the following operations on the nasopharynx and neighbouring cavities: tonsillectomy (13 cases), mastoidectomy (2), and nasal septum antrostomy, plastic operation, and tooth extraction (1 case each). Apart from the two mastoidectomies the interval between the operation and the onset of scarlet fever was from two to ten days. Joe is of opinion that the virus is present in the throat at the time of the operation and enters through the cut surface. He suggests that a Dick test should be performed before an operation on the nasopharynx, and in cases where the reaction is positive passive immunization should be carried out.

In a study of 600 scarlet fever patients, of whom 122 (20 per cent) had undergone tonsillectomy, W. L. Bradford⁷ comes to the following conclusions: The severity of the disease was about the same in the tonsillectomized and the non-tonsillectomized children; 43.9 per cent of the former and 46.9 per cent of the latter developed complications. On appearance of the eruption the average percentage of hæmolytic streptococci in the throats of 312 children with their tonsils was 26.7 as compared with 21 in a group of 85 without tonsils. The average percentage of streptococci in the throat during the first few days of scarlet fever was about equal in the children who later developed complications and in those who escaped whether the tonsils had been removed or not. The rate of disappearance of the organisms from the throat was about equal in children with and without tonsils.

In a paper on mixed infection in scarlet fever, H. Ssawrimowitsch and W. D. Zinserling⁸ state that out of 348 cases of scarlet fever on which a post-mortem examination was held, 32 (9.2 per cent) had bronchitis, 213 (61.3 per cent) pneumonia, 24 (6.9 per cent) pulmonary abscesses, and only 79 (22.6 per cent) no pulmonary lesions. In the cases of bronchopneumonia hæmolytic streptococci and influenza bacilli predominated, whereas in the cases of pneumonia there was a predominance of pneumococci. They conclude that mixed infection with influenza bacilli and pneumococci plays an important part in scarlet fever owing to the development of pneumonia, especially in young children, who are particularly liable to this complication.

A case of disseminated cutaneous gangrene in scarlet fever is reported by H. D. Pasachoff and N. Sobel.⁹ The patient was a previously healthy boy, aged 5 years, who developed the complication in the third week of a moderately severe attack of scarlet fever concurrently with pharyngitis, cervical adenitis, and albuminuria. A blood culture was sterile, but *Staphylococcus aureus* was grown from a gangrenous area. Recovery took place in about three months with superficial and deep scarring.

According to E. H. Place¹⁰ the characteristic heart damage in scarlet fever is a mild endocarditis, which occurred in less than 0.1 per cent of his cases. The diagnosis is based on the presence of fever, cardiac murmurs, change in

the size of the heart, and associated arthritis. Electrocardiographic changes are extremely rare. The onset is typical during the second or third week after the commencement of scarlet fever. The crippling effect is slight compared with that of rheumatic fever.

W. J. Moltchanow¹¹ reports 17 cases of valvular disease complicating scarlet fever which occurred in a children's hospital at Moscow during the period 1929-31. The ages of the children ranged from 4 to 12 years. With the exception of two subtoxic cases, all the attacks of scarlet fever were mild. The endocarditis developed in one case in the second week, in 15 between the third and eighth week, and in one the date of onset was not determined. Two deaths took place from cardiac failure, one six months and the other eleven months after the onset of endocarditis. In 14 cases the endocarditis was associated with arthritis. Moltchanow, who is of opinion that valvular disease complicates scarlet fever more frequently than is supposed, maintains that the occurrence of arthritis during or immediately after scarlet fever should not be regarded as a mere coincidence or as the exacerbation of a pre-existent acute rheumatism, as in most of the cases the rheumatic syndrome did not occur before the attack of scarlet fever.

A case of scarlet fever followed by *meningeal hæmorrhage* is reported by E. W. Goodall,¹² who in his long and extensive experience has never met with another example, nor found any mention of the sequel in works on acute infectious diseases. The patient was a boy, aged 9 years, who, after a mild attack of scarlet fever, developed vomiting and headache followed by twitching of the arms and eyelids, nystagmus, and generalized convulsions. Kernig's sign was present, and the cerebrospinal fluid under hypertension but clear. Death took place on the fourth day. The necropsy showed marked engorgement of the cerebral vessels, an extensive subdural hæmorrhage on the left side extending for about one inch in front of and behind the fissure of Rolando, and a slight hæmorrhage in a similar position on the right side. Apart from two small hæmorrhages on the epicardium and aorta the other organs were normal.

F. G. Kojis and E. J. McCabe¹³ report three cases of scarlet fever complicated by *peritonitis* in a girl aged 10 years, a male infant aged 10 months, and a woman aged 32. Laparotomy was performed in each case, and the girl recovered, while the other two died. The rarity of this complication is shown by the fact that these were the only examples of the kind which occurred among 5500 cases of scarlet fever admitted to the Willard Parker Hospital, New York, from 1928 to 1932. Kojis and McCabe have also collected 16 other cases from the literature in patients aged from 7 months to 31 years: 11 died and 5 recovered; 8 were females, 5 were males, and in 3 the sex was not stated. In the absence of any local abdominal focus the peritonitis in these cases has been attributed to transmission by the blood-stream or lymphatics or to direct extension from the mouth or genitals.

J. Hallé and P. Arondel¹⁴ record a fatal case of *diabetes* following scarlet fever. The patient was a previously healthy boy, aged 5 years, in whom symptoms of diabetes appeared on the seventeenth day of a mild attack of scarlet fever. Death took place in three days in spite of injection of insulin.

(See also KIDNEY, SURGERY OF—THE PREVENTION OF RENAL COMPLICATIONS FOLLOWING SCARLET FEVER.)

PROPHYLAXIS.—G. F. Dick and G. H. Dick¹⁵ found that immunity could be obtained by oral administration once daily of scarlet fever toxin in increasing doses of 4 to 16 c.c. of a toxin containing 50,000 skin-test doses per c.c., though not in so high a percentage as by hypodermic injection; 14 (73 per cent) out

of 19 previously Dick-positive children became negative on the twelfth to sixteenth day after ingestion of the toxin, as compared with 93 per cent of 209 susceptible persons who became negative after hypodermic injection of the usual five graduated doses.

On the other hand, J. V. Cooke¹⁶ found that there was no demonstrable reduction in skin sensitivity after oral administration of large quantities of scarlatinal streptococcus filtrate toxin, whereas rectal instillation of highly concentrated toxin was followed by a constant decrease of skin sensitivity. The skin, however, remained sensitive to large quantities of toxin, thus showing that the absorption of toxin through the rectal mucous membrane was limited.

TREATMENT.—A. Lichtenstein¹⁷ records the following results of **Individual Isolation** of 200 cases of scarlet fever compared with 200 similar cases of the disease which were not isolated: (1) Complications were much fewer in the isolated cases (14.7 per cent) than in the controls (47.1 per cent); (2) Relapses were considerably less in the isolated cases (5.3 per cent) than in the controls (11.6 per cent); (3) A Dick reaction which was positive at the beginning of the disease became less often negative in the isolated cases than in the controls; (4) The number of return cases was lower among the isolated cases than among the controls; (5) The frequency of hæmolytic streptococci in the patients' throats was as great among the isolated cases as among the controls.

H. S. Banks,¹⁸ whose previous paper on this subject was recently summarized (see MEDICAL ANNUAL, 1930, p. 455) records his observations on 1204 cases of scarlet fever treated by **Intravenous Injection of Anti-scarlatinal Serum** in the course of four and a half years. The usual results were as follows: (1) The temperature fell by crisis, and toxæmic symptoms disappeared in from six to twelve hours; (2) Faucial oedema subsided in about twelve hours; (3) The rash faded in twelve to twenty-four hours; (4) Desquamation was usually entirely absent if the serum had not been given later than the third day of disease; (5) The frequency of complications was considerably reduced; (6) There was only one death; (7) The average stay in hospital was 16.6 days; (8) Return cases ranged from 0.9 to 3.4 per cent for each year of investigation. According to Banks intravenous injection of antitoxin is indicated in all cases of scarlet fever except the very mild, cases of asthma, eczema, hay fever, and other manifestations of allergy, and cases which have had a previous injection of serum within the last two years or given other signs of serum sensitivity.

J. E. Gordon¹⁹ states that among 13,003 cases of scarlet fever treated at a Detroit hospital during the last ten years 240 were injected with **Convalescent Serum**. The two principal indications for this treatment were early septic scarlet fever and septicæmia with late complications, such as acute mastoiditis or sinus infections. The donor's attack of scarlet fever was not more recent than thirteen days previously or earlier than three or four months. One transfusion was usually sufficient, but in some cases from two to six were required. The doses were 100 to 150 c.c. for infants and young children, 300 c.c. for older children, and 500 c.c. for adults.

REFERENCES.—¹*Med. Res. Coun. Spec. Rep. Series*, 1933, No. 180; ²*Bull. Off. internat. d'Hyg. publ.* 1932, 1883; ³*Brit. Jour. Child. Dis.* 1932, xxix, 253; ⁴*Bull. Soc. de Péd. de Paris*, 1932, May, 363; ⁵*Wien. klin. Woch.* 1932, Nov. 25, 1477; ⁶*Brit. Med. Jour.* 1932, ii, 351; ⁷*Amer. Jour. Dis. Child.* 1932, xlv, 279; ⁸*Jahrb. f. Kinderheilk.* 1933, cxxxviii, 319; ⁹*Arch. Dermatol. and Syph.* 1932, xxvi, 428; ¹⁰*New Eng. Jour. Med.* 1932, clvii, 864; ¹¹*Jahrb. f. Kinderheilk.* 1933, cxxxviii, 129; ¹²*Brit. Jour. Child. Dis.* 1933, 117; ¹³*Amer. Jour. Med. Sci.* 1933, clxxxv, 710; ¹⁴*Bull. Soc. de Péd. de Paris*, 1933, 101; ¹⁵*Jour. Amer. Med. Assoc.* 1932, cxviii, 1436; ¹⁶*Amer. Jour. Dis. Child.* 1933, xlv, 54; ¹⁷*Acta Paediat.* 1932, xii, 181; ¹⁸*Jour. of Hyg.* 1933, xxxiii, 282; ¹⁹*Jour. Amer. Med. Assoc.* 1933, c, 102.

SCHISTOSOMIASIS.*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

EPIDEMIOLOGY AND PROPHYLAXIS.—An illustrated descriptive technical study of the cercariæ of *S. hamatobium* and of *S. mansoni* in the Sudan is recorded by R. G. Archibald and A. Marshall^{1,2}. They found that the development from the miracidia stage to adult cercariæ in the molluscan host takes at least six to eight weeks. Grey monkeys were successfully infected through the skin with both forms of schistosomes. The question whether sheep and cattle can act as reservoirs of human schistosomiasis has been investigated in Iraq by C. MacHattie and others³ in view of the infection of those animals with certain species of schistosomes and reports of the rare occurrence of *S. bovis* in the urine of man. Their experiments showed that the human *S. hamatobium* cannot infect sheep, and in their experience *S. bovis* does not infect man; they suggest that the occasional appearance of *S. bovis*-shaped eggs in human urine may be due to some abnormality in the formation of the egg-shell on the part of *S. hamatobium*.

R. G. Archibald⁴ reports on prophylactic measures against schistosome infections in the Sudan by the addition to drinking water of strong emulsions of the fruit of the tree *Balanites ægyptica*, emulsions of the fruit, bark, and other parts of which he found to have a lethal action on molluscs and bilharzial miracidia and cercariæ, while the addition of the fruit emulsion does not impair the potability of the water. This tree grows naturally in the Sudan, so he suggests planting it along watercourses as a prophylactic measure.

H. B. Day⁵ records a good description of *bilharzial cirrhosis* based on his earlier experience in Egypt. He found that in the early stages a course of **Antimony** injections will arrest the course of the disease even when fever is present, but malarial and hookworm complications must also be treated if present. In later cases not amenable to antimony **Splenectomy** has sometimes been performed with striking success if the spleen is much affected. A dose of pneumococcal vaccine before the operation is advisable to protect against lung complications.

REFERENCES.—¹*Jour. Trop. Med. and Hyg.* 1932, Aug. 1, 225; ²*Ibid.* Sept. 1, 257; ³*Trans. Roy. Soc. Trop. Med. and Hyg.* 1933, July 28, 173; ⁴*Ibid.* 207; ⁵*Jour. Trop. Med. and Hyg.* 1933, Jan. 16, 17.

SCOLIOSIS. (See SPINE, AFFECTIONS OF.)

SENILITY, SURGICAL OPERATIONS IN. (See SURGICAL OPERATIONS IN SENILITY.)

SERUM SICKNESS.*J. D. Rolleston, M.D., F.R.C.P.*

SYMPTOMS AND COMPLICATIONS.—L. W. Hunt¹ gives the following account of serum sickness as observed at the Durand Hospital, Chicago, since its establishment nineteen years ago. Serum sickness was noted in 804 (28.1 per cent) of 2859 patients who had had diphtheria antitoxin, in 198 (22.7 per cent) of 850 who had had scarlet fever serum, and in 81.8 per cent of 55 who had had antimeningococcus serum. The development of a serum reaction after injection of diphtheria or scarlet fever antitoxin was determined by the individual susceptibility, the toxic properties of the serum, and most of all by the total quantity of serum injected. The incidence of serum reactions did not differ widely in the various age groups. The interval between the injections and the appearance of the reaction varied from a few minutes to thirty days, but most of the reactions developed before the eleventh day.

E. W. Goodall² reports a case of *recurring serum rash* in a girl aged 2 years after injection of 12,000 units of diphtheria antitoxin. In the course of six weeks she developed on six occasions an erythematous rash such as is common

after injections of serum. There was no pyrexia or any other symptoms accompanying the rash beyond the occurrence of an abscess at the site of injection. There was no history of any previous injection of serum to explain recurrence.

W. Mikulowski³ reports two cases of *spontaneous serum sickness*. The first was that of a boy, aged 3 years, the subject of tuberculous peritonitis, who on absorption of the peritoneal effusion developed a transient and painful oedema of several joints, a hemorrhagic eruption, and urticaria, accompanied by leucopenia, hypotonus, and oliguria. The second patient was a girl, aged 8 years, suffering from tuberculous pleurisy and peritonitis, who developed arthralgia in the vertebræ and upper limbs accompanied by generalized urticaria as the effusion became absorbed.

Aubertin and Gré⁴ report a *fatal case* of serum sickness. The patient was a previously healthy man, aged 39, who had been injected with an unknown dose of antigangrene serum in May, 1916, for gas gangrene of the left arm, and in May, 1931, developed diphtheria. The following day he was given a desensitizing dose of $\frac{1}{2}$ c.c. diphtheria antitoxin, an hour later 1 c.c., and five hours later, as no symptoms had developed, 80 c.c. partly subcutaneously and partly intramuscularly. Two hours after the last injection he had an intense generalized erythema and a tendency to cardiovascular collapse. These symptoms, however, disappeared in two hours after intramuscular injection of quinine and ingestion of coffee. The following days 60, 40, and 20 c.c. of diphtheria antitoxin were injected without any symptoms, but seven days after the first injection late serum sickness set in and proved fatal in five days after passing through three stages, the first being one of cardiovascular collapse, the second a confusional state with convulsions, and the third one of terminal coma. Death was apparently due to nervous exhaustion resulting from almost sub-intrant convulsions lasting for two days. No autopsy is mentioned.

J. B. Doyle⁵ has collected 49 cases of *nervous complications* of serum sickness : 44 occurred in males and only 5 in females. The average age was 26.9 years. The average interval between the first injection and the onset of serum sickness was 6.8 days, and the average interval between the onset of serum sickness and the nervous complication 2.1 days. In 34 the complication followed tetanus antitoxin, in 5 scarlet fever antitoxin, in 2 antipneumococcus serum Type I, and in 1 antimeningococcus serum. The nature of the nervous complication was as follows : unilateral motor paralysis of upper brachial plexus 13 cases, mononeuritis 8, optic neuritis 6, brachial plexus (bilateral motor) 4, brachial plexus (bilateral sensori-motor) 4, upper brachial plexus (bilateral motor and bilateral sensori-motor 3 each) 6, and 1 case each of unilateral motor affection and unilateral sensori-motor affection of brachial plexus, bilateral motor involvement of brachial plexus, and urticarial oedema of the brain and meninges.

From a study of the *blood* in 36 cases of serum sickness in patients aged from 3 to 46 following injection of antitoxin for diphtheria, cerebrospinal fever, and scarlet fever, E. Pouhin⁶ comes to the following conclusions : The presence of serum sickness has no effect on the variations in the amount of horse albumin in the blood serum. During the occurrence of serum sickness the blood serum acquires the property of producing flocculation in the presence of horse serum. Precipitins appear at the onset and increase until the end of serum sickness, when their quantity diminishes. Their amount does not have any relation to the intensity of serum sickness. In some cases precipitins do not develop at all, or rarer still they may develop in the absence of any symptoms of serum sickness.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1932, xcix, 909; ²*Brit. Jour. Child. Dis.* 1932, xxix, 288; ³*Arch. de Méd. des Enf.* 1933, xxxvi, 161; ⁴*Gaz. hebdom. Sci. méd. Bordeaux.* 1932, liii, 501; ⁵*Amer. Jour. Med. Sci.* 1933, clxxxv, 484; ⁶*Thèse de Paris*, 1932, No. 604.

SEX HORMONES.*W. Langdon Brown, M.D., F.R.C.P.*

Male Hormones.—Kenneth Walker¹ states that, although he has been experimenting with the oral administration of testicular extracts for a good many years, he cannot recall a single case in which positive results have been obtained. Doubtless this is because very little capacity for storing the male hormone exists in the testis. This has been conclusively proved since it has been isolated in a pure crystalline state by A. Butenandt.² It is found to be an oxyketone with the formula $C_{19}H_{28}O_2$, and it has been termed 'proviron'. Many observers have shown that even a pound of bull's testes contains very little of this substance. Fortunately for future prospects another means of obtaining it has been discovered, since it has been found to be excreted in the urine, and this may prove to be of great practical importance. But until proviron becomes a commercial possibility, probably the best method of attacking testicular inadequacy is through the pituitary. K. Walker has used the extract of anterior pituitary prepared in Professor Crew's experimental farm and thinks it has been beneficial in certain cases. However much we may be impressed by the laboratory results, he thinks we must admit that neither vasoligature nor the implantation of grafts has met with equal success in clinical medicine.

Macro-genito-somia.—Precocious sexual and bodily development may be associated with tumours of the suprarenal body, ovary, pineal gland, pituitary, or testis. Abnormal development associated with tumours of the testes is so rare that only two cases have been reported. It is of special interest therefore that D. M. Sutherland³ has recorded precocious development, including premature bony unions, in a boy of 11, from whom he removed a large tumour from the right testis, which was composed of cells indistinguishable from the normal interstitial cells. No normal testicular tubules or epididymis could be found. This appears to prove that the interstitial cells have an internal secretion influencing growth. It is further of interest, however, to note that the photograph of the patient that illustrates this communication shows a marked strabismus (Fig. 78), as is common in the cases of pineal origin, which suggests that there may have been a pineal factor in inducing premature growth and the abnormal condition of the testis.

Ovarian Hormones.—The preparation of oestrin in a pure crystalline form has facilitated much valuable work on its chemistry. According to Butenandt it is a partially hydrated phenanthrene-ring derivative, one of the oxyketones. Its constitution thus seems to be very similar to that recently demonstrated for the sterols and biliary acids. It occurs in several isomeric

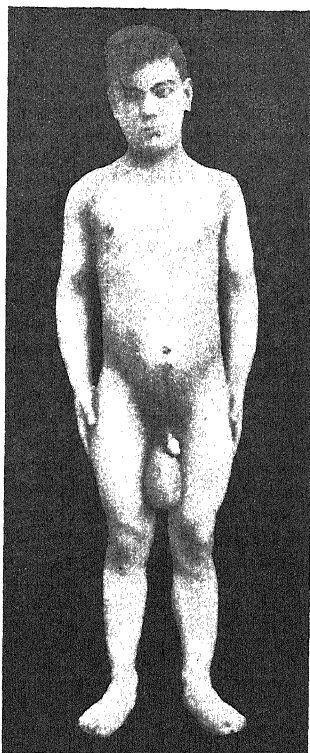


Fig. 78.—Photograph of patient with macro-genito-somia. (By kind permission of the 'British Journal of Surgery'.)

forms which differ considerably in their activity. It has been shown by Loewe⁴ and by Johon to occur in plants, evidencing a new link between the animal and vegetable kingdoms. Relevant to this is Aschheim's (quoted by W. Schoeller⁵) demonstration of this hormone in an oil extracted from peat, coal, and petroleum. It is astounding that œstrin originating from plant or animal material should have remained undecomposed during the years required for the formation of mineral coal or petroleum. Small quantities of this hormone may accelerate the flowering of certain plants, and altogether the subject of the influence of hormones on plant physiology is assuming a new importance.

The question has been taken a step further by J. W. Cook and E. C. Dodds,⁶ who have not only synthesized œstrin but have shown its close clinical relationship both to the carcinogenetic substance to be found in tar and to vitamin D. All three contain the condensed anthracene ring, and only differ in their degree of hydrogenation. It is an extraordinarily interesting fact that the necessary stimulus to reproductive activity, the substance which is required for the proper growth of bone, and the one which plays a part in the disordered growth of malignancy should all be so closely related. It adds to that interest to find the first and the third of them present in the coal measures deposited by the aid of the sunlight of past ages and to remember that the second is formed in our own subcutaneous tissues by the sunlight of to-day.

Since the chemical basis of œstrin is so well established, it is disappointing that the clinical applications are still far from satisfactory. F. H. A. Marshall⁷ thinks that some of the mistakes have been made by failing to recognize the great differences in the œstral cycles of different types of mammals and thus being misled by false analogies into using the wrong preparation or at the wrong time. He considers that the incorrigible tendency to use ovarian extracts almost at random in cases of any sort of sexual derangement is still doing much to discredit their ultimate utility.

Bruce Webster⁸ claims benefit from the intravaginal administration of the ovarian follicle hormone in twenty cases, as evidenced by the induction of uterine bleeding. But J. Rock,⁹ in repeating Marshall's caution, reminds us that such bleeding may not be due to endocrine conditions at all, and suggests that regarding it as such may lead to delay in the diagnosis of malignant disease.

REFERENCES.—¹*Practitioner*, 1933, April, 525; ²*Zeits. angewand. Chem.* 1931, xlv, 905; ³*Brit. Jour. Surg.* 1932, Oct., 343; ⁴*Biochem. Zeits.* 1927, clxxx, 1; ⁵*Lancet*, 1933, i, 38; ⁶*Nature*, 1933, cxxxi, 205; ⁷*Brit. Med. Jour.* 1932, ii, 232; ⁸*Amer. Jour. Med. Sci.* 1932, Dec., 822; ⁹*New Eng. Jour. Med.* 1932, Feb. 16, 362.

SHARK ATTACKS IN AUSTRALIAN WATERS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

V. Coppleston¹ draws attention to the danger of sharks in certain areas, and, having regard to the recent development of shark-fishing as a sport in home waters, certain points in this paper are worthy of further record.

It would appear that sharks are only dangerous to man in the warmer waters between latitude 40° N. and 40° S. Horses have been attacked and the oars have been torn away from the hands of the rowers in boats and canoes. Severe injuries have been inflicted on bathers. A shark may lash out with his tail after being hooked and hauled on board ship, and serious injuries have resulted. The following conclusions are given by Coppleston:—

1. Attacks by sharks have been reported from many parts of the world and have been known to occur since ancient times.
2. The evidence that sharks will attack man is complete, although in most of the attacks reported the evidence is circumstantial.
3. Sharks will attack horses, boats, and people bathing.

4. A number of attacks on fishermen drawing nets are recorded, and injuries not infrequently occur after a shark has been landed.

5. Instances where men have disappeared and are believed to have been taken by sharks are recorded.

6. Since 1919 twelve attacks on people bathing have occurred in Queensland, two in Victoria, one in South Australia, two in Western Australia, three in Sydney Harbour, nine on the beaches near Sydney, six in the vicinity of Newcastle, and two in other parts of New South Wales.

7. Of thirty-four varieties of sharks known to occur in New South Wales waters, eight are suspected of being man-eaters. In the two instances in which definite evidence of the species of attacking shark is known, the shark has been a whaler (*Carcharhinus macrurus*).

8. The attacks occur mainly during certain months at any given locality. There is reason to believe that shark attacks are influenced in some way by sea temperatures.

9. Attacks may occur at any time of the day, but are more common after 3.30 p.m.

10. Any formation of the beach may be found at the time of an attack, which may take place in shallow or deep water, at the water's edge or a considerable distance from the shore.

11. Those bathing alone or on the edge of a crowd are most liable to be attacked. Attacks on a crowd are uncommon.

12. It is usual for the shark to make more than one attack on its victim. Arms and fingers are particularly liable to be taken off during the second or third attack.

13. In many of the instances recorded sharks have been known to have been in the vicinity prior to the attack.

14. Almost all shark victims are rescued. There is no known instance of a rescuer being attacked.

15. Sharks will attack dark-skinned races.

16. Though there appears to be some doubt, it is almost certain that sharks will attack dead bodies.

17. The wounds are usually multiple; other wounds are caused in addition to the bite.

18. In almost all instances some injury to the buttocks or lower limbs has occurred.

19. The mortality rate of shark attacks is between 73 and 80 per cent. Many of the wounds received are in themselves fatal.

20. In the treatment, the first-aid treatment, particularly the immediate arrest of hæmorrhage and the treatment of shock, is of paramount importance.

21. Severe sepsis sometimes follows from the bite, which in itself may be fatal, but not in all cases. Prophylactic injections of **Gas Gangrene Antiserum** and **Antitetanic Serum** are advisable.

REFERENCE.—¹*Med. Jour. of Australia*, 1933, April 15, 1.

SKIN. (See also COSMETICS; DERMATITIS MEDICAMENTOSA; DERMATITIS VENENATA; ICTHYOSIS; LUPUS ERYTHEMATOSUS; PEMPHIGUS; PSORIASIS; ROSACEA.)

SKIN, FUNGOUS AFFECTIONS OF.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Ringworm of the Scalp.—W. A. Lloyd¹ has treated 50 cases of scalp ringworm by **Thallium Acetate**, using 8.5 mgrm. per kilo body weight as a standard dose. All the cases treated except two, which for definite reasons

were given a smaller dose, were cured. He supplemented the treatment with the inunction of 10 per cent **Sulphur Ointment**, as recommended by Percival, but found the 2 per cent iodine solution recommended by Ingram too irritating. Toxic symptoms occurred in 43 per cent of cases, but with one exception they were of the mild pseudo-rheumatic type, shown by malaise, lethargy, weakness, and loss of muscular power and pains, particularly in the legs. One case, a boy of 5 years, gave rise to anxiety. On the eighth day a diffuse rash was noticed on his legs. On the eleventh day the rash appeared all over the body; the face and neck were swollen and the legs œdematous. The temperature was normal and a trace of albumin was present in the urine. The child remained in bed for a week and recovery was uneventful. Lloyd stresses the value of this method of treatment in small institutions where X rays are not available. He was able to stamp out an epidemic in twenty children in eighty-five days, which he believes to be shorter than could have been produced by X rays. He recognizes that thallium acetate is a dangerous drug and must only be employed with the most careful technique.

In this connection A. Rudy² describes a case of thallium intoxication from the use of a depilatory called 'Korembor'. The patient was a woman of 29 who developed severe pains in the lower back, buttocks, thighs, and legs, with difficulty in rising or resuming the sitting posture. At times she was unable to change her posture without violent pain. The symptoms subsided immediately the use of the depilatory was abandoned, but a sudden relapse occurred when the preparation was again used. Analysis by the American Medical Association Chemical Laboratory found the preparation to contain about 7 per cent of thallium acetate. The author points out that Sabouraud has warned against the use of an ointment containing more than 1 per cent of thallium acetate, and then only a minute quantity should be used.

Ringworm of the Feet.—R. L. Gilman³ examined the feet of 500 male and 285 female university students in Philadelphia and found that about 60 per cent in both sexes had evidence of ringworm infection between the toes. He does not believe there is any one specific for ringworm: proper foot hygiene—that is, the frequent changing of the shoes and socks and the thorough drying of the toes after washing—is the first consideration. In this connection the observations of O. L. Levin and G. H. Silvers⁴ are of interest. These observers thought that the reaction of the sweat in the fourth interdigital space might have some bearing on the frequency with which this area was infected with fungus. Their investigations showed that the pH reaction of the interdigital spaces of the feet and axillæ was higher than that of the normal skin, being in the neutral region, while the sweat of the general surface of the body is definitely acid. The presence of apocrine glands, which secrete an alkaline secretion, accounts for the change of reaction in the axilla, but no apocrine glands have been demonstrated in the feet. The authors believe that the changed reaction of the sweat and its enhanced value as a medium for fungus growth must be due to the mechanical and physiochemical features of delayed evaporation and trauma. These observations, therefore, indicate the importance of frequent washing and change of socks. They recommend the use of talc powder containing 1 or 2 per cent **Salicylic Acid** as a prophylactic against the growth of fungus.

Gilman recommends for acute cases compresses or foot-baths of saturated **Boric Acid Solution** or **Burow's Solution** (liq. aluminii acetici) 1-16; for the subacute cases baths of 1-4000 **Potassium Permanganate**. Later 5 per cent **Ammoniated Mercury Ointment** or 6 per cent **Crude Coal Tar**, or 3 to 5 per cent **Pine Tar Ointment** is used. Only when signs of acuteness have subsided is it safe to use **Whitfield's Ointment** (3 per cent salicylic

acid and 6 per cent benzoic acid strength). He also uses **Mercurochrome** in the mildest cases and Castellani's **Fuchsin Paint** for the more resistant ones. An alcoholic solution of 4 per cent **Salicylic Acid** and 8 per cent **Resorcinol** applied to the toes, with a foot powder used in the day time, is helpful in cases associated with excessive sweating.

D. Spring⁵ has investigated the action of **Chlorinated Water** in swimming baths on fungus in scales detached from bathers' feet. She finds the fungus viable after a period of one and a half hours, but it is often destroyed after two hours' immersion.

H. F. Smyth and H. F. Smyth, jun.,⁶ have investigated the value of certain **Pine Oils** on some fungi of the skin *in vitro*. They used a white and a pale yellow pine oil, and steam-distilled wood turpentine, together with fenchyl alcohol, alpha-terpineol, and borneol, which are derivatives of these substances. Neither 1 per cent nor 10 per cent dilutions were of much value in killing the cultures; the 100 per cent oils were, however, quite effective in these tests *in vitro*. **Alpha-terpineol** was the most effective against the organisms, and **Fenchyl Alcohol** and the two pine oils almost alike. Turpentine showed practically no action against the cultures. The authors believe that pine oil has definite value as a fungicide. Considering cost and effectiveness, 'very pale yellow' pine oil seems to be the most practical of the materials tested. One advantage which it has over other materials lies in its low vapour pressure. It stays in contact with the infection for a long time. Two or three applications daily are adequate to maintain almost constant contact with the organism.

Trichophytides.—M. B. Sulzberger and F. Wise⁷ lay stress on the frequency with which fungous infections of the skin may be associated with secondary eruptions due to dissemination of harmful agents from the primary focus. These are usually free from living fungi. These so-called 'trichophytids' may take various forms: among others eczematous patches are frequent, but other forms such as urticaria, vasomotor rhinitis, asthma, and perhaps generalized exfoliative dermatitis may occur. They recommend that **Trichophytin** (a vaccine prepared from fungi) should be more extensively used in investigating cases where the etiology is undetermined. They note three types of reaction produced by trichophytin: (1) The immediate urticarial reaction (due to the presence of circulating antibodies in the blood); (2) The late inflammatory reaction after intradermal injections; and (3) The eczematous reaction to a patch test. The authors believe that desensitization is the rational method of dealing with such cases and they have made attempts to apply this method. In eighteen cases desensitization by means of intradermal injections of trichophytin was attempted. About two-thirds of the cases seemed benefited by the treatment, these showing either long remissions, marked improvement, or apparent cure. They do not consider, however, that the method is by any means suitable for general treatment; they only recommend it as an ultimate measure in severe and refractory cases in patients who are willing to co-operate in the treatment.

E. Muskatblit and W. Director⁸ have prepared a polyvalent trichophytin containing the endo- and ecto-products of *Epidermophyton*, *Trichophyton*, and *Microsporon* fungi. Tests with this preparation, in 300 mycotic cases, gave 72.3 per cent positive reactions. *Monilia* infections also gave positive reactions, but less frequently than cases due to filamentous fungi. They conclude that the intradermal test, while not absolutely specific, is of considerable value in the diagnosis of fungous infections of the skin; that cutaneous allergy develops not only in deep inflammatory mycoses but also in many cases of the superficial type; and that *Epidermophyton interdigitale*, the commonest

fungus in ringworm of the toes, is apt to cause a considerable degree of cutaneous allergy.

Monilia Infections.—Under the term 'levurides', P. Ravaut and H. Rabeau⁹ describe a series of eruptions which they believe to be comparable to the 'trichophytides', the primary infection being an organism of the yeast-like type (*Monilia*, *Oidium*, *Cryptococcus*, etc.). The eruptions described by these authors belong to the group of chronic scaly superficial dermatitis, some of them eczematous and others psoriasiform in type. The group is a well-known one to dermatologists and has been called by Brocq 'parakeratosis psoriasiforme' and by Darier 'psoriasiform eczematide'. Some cases are so like psoriasis clinically that they can only be distinguished by histological examination, others are frankly eczematous in character. Ravaut and Rabeau claim to have demonstrated by cutaneous reactions to levurine (a vaccine prepared from *Monilia* and allied organisms) that some of these cases are allergic manifestations of infection by one or other of these fungi. Their work, though by no means conclusive at present, is very important and opens a field for further investigation, not only into the etiology of these obscure eczematous reactions, but also into that of psoriasis.

REFERENCES.—¹*Brit. Med. Jour.* 1933, ii, 99; ²*New Eng. Jour. Med.* 1932, Dec. 22, 1151; ³*Jour. Amer. Med. Assoc.* 1933, March 11, 715; ⁴*Arch. of Dermatol. and Syph.* 1932, Sept., 466; ⁵*Amer. Jour. Med. Sci.* 1933, June, 775; ⁶*Arch. of Dermatol. and Syph.* 1932, Dec., 1079; ⁷*Jour. Amer. Med. Assoc.* 1932, Nov. 19, 1759; ⁸*Arch. of Dermatol. and Syph.* 1933, May, 739; ⁹*Presse méd.* 1932, Dec. 21, 1925.

SKIN, NEW GROWTHS OF. A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

In the last issue of the MEDICAL ANNUAL (p. 428) attention was called to the methods of treating epithelioma of the skin by radium. Certain authors, however, still prefer other methods of treatment, some of which are indicated here.

J. J. Eller¹ gives a summary of the methods he employs in dealing with *cancerous and precancerous dermatoses*. He points out that a large number of physical agents are available, such as radium, X rays, diathermy (including cutting current, electro-desiccation, electro-coagulation), the cautery, electrolysis, carbon-dioxide snow, the curette, and the scalpel. For a number of small superficial lesions which sometimes undergo cancerous change, such as senile and seborrhœic keratoses, tar, and oil and arsenic keratoses, he finds **Electro-desiccation**, either with or without curettage, appropriate. The same method is applicable to patches of leukoplakia in the mouth, but for kraurosis vulvæ he recommends **Excision**. Pigmented moles are best left alone unless they show evidence of growth, when free excision with the **Diathermy** knife is advised. He also used diathermy in dealing with epitheliomatous nodules occurring in cases of lupus vulgaris and lupus erythematosus. Patches of intractable radiodermatitis are best treated by excision.

For *basal-celled epithelioma* (rodent ulcer) the author finds treatment with **X rays** and **Radium** about equally good. The situation and type have to be taken into account in deciding on the type of treatment. When using X rays he gives 3 to 4 skin units of unfiltered X rays, repeating this in six or eight weeks (at least two weeks after all reaction has subsided). Two treatments usually suffice. In larger lesions **Electro-coagulation** is used as a preliminary to X-ray treatment. When radium is used 40 to 50 mgrm.-hours per square centimetre is employed for small superficial lesions, and from 60 to 80 for deeper lesions.

In *squamous-cell epithelioma* the treatment varies largely according to the type and site of the lesion, but the author usually employs radium preceded by electro-coagulation.

L. Taussig² treats most cases of skin epithelioma with **Curettage**, followed by **Electro-desiccation**. In the case of small lesions **Trichloroacetic Acid** is used after curettage instead of electro-desiccation. For cases involving the eyelids, **Radium** is the method of choice. He also recommends it in old and debilitated patients who object to operative procedures.

H. G. Adamson³ also recommends curettage as a preliminary to X-ray treatment in basal-cell epithelioma. He lays stress on carefully curetting away all the growth, which is done under a local anaesthetic. After stopping bleeding by painting the raw area with trichloroacetic acid, he gives 3 to 5 normal skin doses of **X rays** to the raw area, which is carefully isolated by a lead-foil shield. Adamson says that no X-ray reaction of any kind occurs, as no normal skin is exposed to the action of the rays. No dressing is required; the only subsequent treatment is to mop the wound twice daily with industrial spirit till the crust falls off. He lays stress on the rapidity with which the whole treatment can be carried out.

A. A. Epstein⁴ recommends treatment by **Carbon-dioxide Snow** for skin epitheliomata in the early stages when there is no involvement of the deeper structure. In epithelioma of the lip, however, this treatment is contra-indicated. Since 1929 the author has treated 115 cases; of these 66 have been observed over two years, including 26 cases which have been under observation over four years. In the series observed from six months to four years, 87.5 per cent have remained well. Of the cases that recurred, most of the recurrences have taken place during the first twelve months. It is not quite clear whether the author adopts a previous curettage, but he appears to apply the carbon-dioxide snow for two minutes; a considerable local destruction of tissue takes place and healing usually occurs in three to three and a half weeks.

J. A. Elliott⁵ recommends a combination of **Electro-coagulation and Irradiation** for treating epithelioma of the lip. His method of treatment is as follows: "The lip is anaesthetized with procaine hydrochloride. With the index finger within the mouth and the thumb pressed firmly against the lip, sufficient pressure is applied well below the lesion to cut off its blood-supply. A small cutaneous punch is employed to obtain a specimen for microscopic examination. With the pressure still applied, the biopsy wound is thoroughly coagulated. The pressure is then released, and the entire lesion is coagulated. The coagulated tissue is trimmed away with sharp, curved scissors, care being taken not to cut into fresh tissue. The wound is painted with bismuth violet, and a small amount of ointment of boric acid is applied. The lip is then irradiated with unfiltered roentgen rays, while the glands of the neck are given high voltage roentgen therapy. Usually four roentgen treatments are applied to the lip, while two treatments are applied to the glands." Of 66 patients treated by the author, 42 were treated over five years ago, 17 over three years ago, and 8 from one to two years ago. There have been no local recurrences. None has shown metastasis in the glands of the neck. One has a tumour of the brain which appeared seven years after removal of the tumour on the lip, but the nature of the tumour has not been determined. Cosmetic results have been satisfactory.

Development of Sarcoma as a Sequel to Radiotherapy.—It is well-known that epithelioma may develop in the scars of lupus vulgaris, and much more rarely in those of lupus erythematosus. The question has also been raised as to whether X-ray treatment of lupus predisposes to the development of epitheliomata, and on this point some difference of opinion exists. It is quite certain that many cases have occurred in lupus cases that have never had radiotherapy, but whether those cases treated by this method have a higher incidence of this complication is still unsettled. Sarcoma as a complication

of lupus had not been described until recently, when W. J. O'Donovan⁶ described a case, and L. Savatard⁷ two cases. O'Donovan's case occurred in a woman of 59, with lupus of the left wrist and forearm of many years' duration: this had been treated with X-rays and for over three years. Later a lump developed in the scar on the forearm, which was eventually removed and found to be a spindle-celled sarcoma. She died of metastases. Savatard's first case occurred in a man of 54 who had had lupus of the face. He had had some X-ray treatment but this was not excessive and no X-ray atrophy was visible. A tumour developed on the chin which was removed and found to be a myxosarcoma. The second case was a man of 47; he had had lupus of the face for twenty years and had had intensive X-ray treatment. A fungating tumour developed on the left cheek which on removal proved also to be a myxosarcoma.

In this connection D. W. Montgomery and J. D. Viecelli⁸ describe the development of a deep-seated tumour in the upper lip in a patient who had been treated thirty years previously by X rays for sycosis vulgaris, followed by marked X-ray atrophy. The tumour was definitely in the subcutaneous tissue and adherent neither to the skin nor mucous membrane. The tumour had the microscopic characters of a spindle-celled sarcoma. In this case no lupus was present. The authors consider these cases raise a very important question as to whether radiant energy can so influence comparatively inert connective tissue as to cause it to proliferate after the lapse of so many years.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1933, Feb. 11, 385; ²*Amer. Jour. Roentgenol.* 1932, 721; ³*Brit. Med. Jour.* 1933, ii, 994; ⁴*Arch. f. klin. Chir.* 1933, May, 344; ⁵*Arch. of Dermatol. and Syph.* 1933, March, 373; ⁶*Brit. Jour. Dermatol. and Syph.* 1933, Nov., 538; ⁷*Ibid.* 542; ⁸*Ibid.* June, 241.

SKIN, PYOGENIC INFECTIONS OF,

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Impetigo Contagiosa.—J. L. Newman¹ has treated a series of children suffering from this disease by three alternative methods: (1) **Occlusive Dressings**; (2) **Ung. Hydrarg. Ammon. Dil.**; and (3) **Intensive Treatment**. In (1) only elastoplast bandage was used and the lesions were not touched in any other way. Some selection of the cases was necessary as in certain sites the dressing could not easily be applied. Fifty children were treated in this group. In (2) the patient was given a box of dilute ammoniated mercury ointment and told to keep the lesions well covered with it. Sixty-five children were dealt with in this manner. In (3) crusts were removed by starch poultices and the child attended the clinic for daily dressings with ointment, presumably the same as in (2), and in addition the parent was told to apply the ointment six times daily. Fifty children were treated by this method. The author finds the average time taken for a cure was 9·7 days in group 1; 18·6 days in group 2, and 22·5 days in group 3. One patient treated with elastoplast for lesions about the knee developed a subcutaneous abscess in the thigh, while one treated by the intensive method developed an abscess in one of the inguinal lymphatic glands. [Most dermatologists would agree that occlusive dressings are essential to the rapid cure and prevention of spread of impetigo contagiosa, and that too intensive treatment is harmful; also that the promiscuous use of ung. hydrarg. ammon. dil. is useless; but whether an impervious dressing like elastoplast is the most satisfactory or safest means of obtaining a rapid cure requires further observation and comparison with more modern methods than those employed by the author.—A. M. H. G.]

Boils.—R. Hallam² discusses the cause and treatment of recurrent boils. He notes that the highest incidence occurs between the ages of 21 and 30, and

that only 18 per cent in his series were females. He considers intercurrent infection of the skin an important etiological factor; it was present in about one-third of his cases. As regards treatment, he advises that the skin should be kept as dry as possible, as the self-disinfecting power of the skin is influenced by the amount of moisture present. This has particular bearing on the use of fomentations, which he rightly points out are a potent means of spreading skin infection. He recommends frequent cleansing of the surrounding skin with **Spirit** and the direct application of pads of gauze soaked in spirit as a covering to the boil. Hallam considers that, as a prophylactic, vaccines do not live up to their reputation, and is not convinced of the value of yeast as a prophylactic. He is, however, convinced of the utility of injections of **Colloidal Manganese Hydroxide** in this condition. As regards the local treatment of boils, the author is not prepared to decide between the two schools which advocate, on the one hand, surgical interference, and, on the other, allowing nature to take its own course.

W. A. Ball³ claims to have had some success in treating cases of furunculosis with tablets containing **Thyroid** gr. $\frac{1}{2}$ and **Pot. Permanganate** gr. $\frac{1}{8}$ three times daily in conjunction with an **Iron and Arsenic** mixture.

Sycosis Barbæ.—A. Marin⁴ discusses the value of **X-ray Treatment** of sycosis barbæ. He points out that three different types of treatment may be indicated. Some cases respond to doses insufficient to cause epilation; this he attributes to the fact that the X rays produce a defensive reaction in the skin, enabling it to rid itself of various forms of pyogenic dermatitis after a few radiations. A second group of cases require temporary epilation. This is done according to the Kienböck-Adamson method by overlapping doses. The face is divided into four areas and the tube is centred successively on: (1) The angle of the right mandible; (2) The angle of the left mandible; (3) The centre of the upper lip; (4) The centre of the chin. Exposures (3) and (4) should be at right angles to one another. The author points out that the margin between the epilating dose and the erythema dose on the face is less than on the scalp, and that the epilating dose, if given at the outset, often brings about erythema with distressing sequelæ. To obviate this it is better not to epilate at a single dose but to give one-quarter of an erythema dose on four occasions, with intervals of three days between each. The author has rarely found filtration necessary except in deep-seated lesions. Permanent epilation is very rarely called for, and the risk of subsequent telangiectases is very great; the author, however, thinks these may be preferable to severe forms of sycosis. He gives the same course as described above, and then, after the hair has fallen, administers every three weeks half an erythema dose during four or five months. If the case is carefully watched, erythema rarely occurs. It is especially stressed that no strong local applications should be applied during this treatment: he also considers ultra-violet ray treatment, in conjunction with X rays, should be prohibited. In 17 cases treated by the author 13 were cured by light radiation and 4 by temporary epilation.

J. A. Scott⁵ describes a new method of treating sycosis barbæ. He tells the patients to puncture the pustules with a clean needle, then to wash the skin with 10 per cent **Ichthyol Soap**, to remove the soap with a fresh lot of water, to dry with a towel, and then to paint all the affected region with a 75 per cent **Solution of Ichthyol** in water. In a few minutes the paint is dry and will not come off on the bed linen. The next morning washing in plain water will take it all away. The treatment must not be used for recent, acute, partly eczematous, follicular infections of the beard and moustache regions; it makes them worse and causes a good deal of weeping: 12 to 20 gr. of **Zinc Sulphate** to 8 oz. of **Calamine Lotion** as a rule answers best at this

stage. If crops of boils develop he gives, in addition, a course of **Auto-hæmotherapy**, injecting 2 to 3 c.c. of blood under the skin once a week. The author also finds a 75 per cent solution of ichthyol useful in chronic blepharitis and folliculitis in the nostrils, as well as in circumoral dermatitis with fissuring of the skin.

Granuloma Pyogenicum.—D. W. Montgomery and G. D. Culver⁶ call attention to these small and harmless little tumours, which are familiar enough to dermatologists, but not so easily recognized by other practitioners. They are normally seen as pea-sized, bright red tumours, which may be sessile or pedunculated, with either a moist granulating surface or one which is dry and smooth. These lesions are composed of granulation tissue and appear to start from some slight wound. In 50 cases mentioned by the authors 13 occurred on the hand, 8 on the red border of the lips, 10 in the mouth, 13 on face and scalp (including the auricle), 3 on the foot, 1 in the umbilicus, 1 on the leg, and 1 on the back. Although found sometimes in children, the average age in the authors' series was 45 years. As these lesions not infrequently occur in the region of the face and mouth, the authors stress the importance of differentiating them from epitheliomata. To cure them it is necessary not merely to remove the swelling but to destroy the base: thus ligature of a pedunculated lesion is followed by immediate recurrence. The authors advise **Curetting**, followed by **Cauterization** of the base with **Trichloracetic Acid**; **Excision** may also be used, preferably followed by **X-ray** or **Radium Treatment**. [**Diathermy** or destruction by the **Galvano-cautery** are also very useful methods of treatment.—A. M. H. G.]

REFERENCES.—¹*Brit. Med. Jour.* 1933, i, 823; ²*Ibid.* 1932, ii, 670; ³*Practitioner*, 1933, Jan., 101; ⁴*Presse méd.* 1932, Nov. 9, 1673, *Canad. Med. Assoc. Jour.* 1933, June, 621; ⁵*Brit. Jour. Dermatol. and Syph.* 1933, May, 190; ⁶*Arch. of Dermatol. and Syph.* 1932, July, 131.

SKIN, TUBERCULOSIS OF. A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Lupus Vulgaris.—L. Rogers¹ again calls attention to the use of derivatives of **Chaulmoogra Oil** and **Sodium Morrhuate** in the treatment of lupus vulgaris. He quotes an extensive case of this disease in which remarkable improvement occurred by the local injection of these preparations. He first used ethyl ester morrhuate, injecting a drop or two into several points along the margin of the diseased area. Marked, though slow, improvement occurred in these areas without any breaking down of the tissue. Later he tried ethyl ester hydnocarpate in the form of 'moogrol' with 4 per cent creosote added as an antiseptic. The local improvement was more rapid, and some ulceration occurred in untreated areas, which the author regarded as a reaction in the diseased tissues similar to the swelling and softening of leprous dermal lesions following intravenous or intramuscular injections of the same drug, with ultimately beneficial results in the skin lesions. Later the exposed lupus-diseased tissues in the floors of the ulcers came away, leaving much more healthy-looking skin than before. As the injections proceeded, the reactions in these portions became milder, and an increasing number of points could be injected at a sitting with more rapid improvement. At the end of a year the thickened diseased areas had nearly all disappeared.

S. L. Cummings and C. Weatherall add a note to Rogers's paper on some investigations made with certain of these preparations on the growth of tubercle bacilli *in vitro*. Growths were made on Besredka's fluid egg medium and two substances were tested: alepol (a preparation of the sodium salts of a selected fraction of the lower-melting-point fatty acids of hydnocarpus oil prepared by Burroughs Wellcome & Co.), and an emulsion of cod-liver oil reduced to very fine dispersion in saline. In two series of experiments it was

found that alepol inhibited growth in dilutions of 1-10,000 up to 1-1,000,000, but very slight growth occurred in 1-10,000,000. The cod-liver oil preparation showed no inhibition of growth. A series of experiments *in vivo*, however, were inconclusive.

[Though no conclusion can be drawn from isolated cases, the author does well to keep this method of treatment before the medical profession. The present reviewer has on several occasions brought to the notice of his colleagues the remarkable improvement which can be obtained by the injection of sodium morrhuate in certain cases of lupus pernio and the hypodermic sarcoid of Boeck—conditions which are considered by many to be tuberculous in nature.—A. M. H. G.]

J. H. Broers² strongly advocates the treatment of lupus vulgaris by **Pyrogallic Acid**. This is an old method of treatment, originally advocated by T. Veiel in 1893, and has been used largely in the past, but it has rather fallen into disuse as it is a slow and painful method. The author has, however, obtained the co-operation of his patients and can claim some very remarkable results. He uses a 10 per cent ointment of pyrogallol in white soft paraffin, with or without 2 per cent percaïne. The duration of treatment in 21 cases reported varied from 52 to 240 days. The ointment is applied spread on cotton bandages and changed twice a day. The reaction produced is considerable and the patient must be warned of this. When large areas are being treated the urine must be examined, as nephritis may result from absorption if too large areas are treated.

M. Ducourtieux³ strongly advocates **Electro-coagulation** in the treatment of this disease. Strong currents are used and the active electrode is a small button the size of a pin's head. Coagulation $\frac{1}{2}$ to 1 cm. in diameter is obtained at each application. Lesions of about 10 cm. in size are dealt with in two or three sittings at intervals of two or three months, the points of application being disposed like a chess board, so as to avoid too much contraction of the scar. For quite small lesions the points of coagulation are allowed to touch one another. The method is also suitable for lupus verrucosus; the coagulated warty tissue can be removed with a curette to allow further destruction of the base with the diathermy electrode.

REFERENCES.—¹*Brit. Med. Jour.* 1933, i, 47; ²*Arch. of Dermatol. and Syph.* 1932, July, 68; ³*Presse méd.* 1932, Oct. 19, 1581.

SLEEPING SICKNESS. (*See* TRYPANOSOMIASIS.)

SMALL-POX. (*See also* VACCINATION.) J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to the Report issued by the Health Section of the League of Nations¹ on the incidence and fatality of small-pox throughout the world for 1931-2, no case occurred during 1931 or the first half of 1932 in any of the following countries: Austria, Belgium, Bulgaria, Danzig, Denmark, Esthonia, Ireland (Northern Ireland and Free State), Latvia, Lithuania, Luxembourg, Malta, Scotland, Switzerland, and Yugoslavia. There are, however, three important foci of small-pox in Europe, viz., Soviet Russia, where the disease is usually severe and seems to be on the increase; England, where a very mild type is present; and the Iberian peninsula, where the disease is mild in Spain but much more severe in Portugal. Asia is the continent most severely affected by small-pox, British India being the most important focus of the disease in the world. Mexico, where 9971 fatal cases occurred in 1931, is the chief focus of virulent small-pox in America. In Canada and North America the incidence is falling and the case fatality is very low. In Central and South America there are small scattered foci of the severe type. Throughout Africa there has been a decline in the disease.

C. V. Chapin and J. Smith² remark that a mild strain of small-pox has been present throughout the United States for at least the last thirty years. Notification has been very defective, but the deaths have been better recorded as they attract more attention. The case fatality (ranging from 0·31 per cent in 1917 to 1·64 per cent in 1900), though considerably lower than that of classical small-pox, is higher than that now prevalent in England, but this is probably due to the better notification of cases in this country. Chapin and Smith, like other American health officers, maintain that the present mild type of small-pox which first appeared in the United States in 1896 has since bred true and has never reverted to the classical type, although outbreaks of the latter have been imported from Mexico and from seaports.

In an official work on small-pox in Egypt Ahmad Hilmy Bey³ states that two important epidemics have occurred in Egypt in recent years, one in 1919 with a case fatality of 24·39 per cent, and the other in 1926 with one of 20·25 per cent. Vaccination has been carried out extensively throughout the country, with the result that the incidence of small-pox has fallen from 2676 cases with 542 deaths (20·25 per cent) in 1926, to 240 cases with 34 deaths (14·17 per cent) in 1927, and 26 cases, of which 19 were imported, with 4 deaths in 1929, while in the following two years there were only 14 and 10 cases respectively, of which 20 were imported, with no deaths.

According to M. Tsurumi⁴ the incidence of small-pox in Japan was 124,991 cases during the period 1880–8, 149,012 during 1889–98, 22,607 in 1899–1908, 7864 in 1909–18, and 15,174 in 1919–20. The decline in the decennium 1899–1908 was due to the application of laws relating to prevention of infectious diseases and improved methods of vaccination, while the increase in the last period was caused by greater frequency of communication with China, where small-pox is endemic. During 1912–28 the period of greatest prevalence was from March to July. There was then a considerable fall, the minimum being reached in September. There was subsequently a slow rise till the end of the year, and a more rapid ascent in January and February.

SYMPTOMS AND COMPLICATIONS.—According to T. W. Lynch⁵ the *fœtus* may be infected by small-pox, or at least a focal eruption may be present, even when the mother has shown no symptoms but has merely been exposed to the disease. The average time from the appearance of the maternal eruption to the birth of the infant is four and four-tenths weeks. Vaccination seldom influences the course of pregnancy and probably does not transfer immunity to the *fœtus*.

R. M. Rice and M. J. Carey,⁶ who emphasize the rarity of the complication, record the case of a boy, aged 5 years, who developed complete right flaccid *hemiplegia* and aphasia two days after the appearance of the eruption of small-pox. The Wassermann reaction was negative in the blood and cerebrospinal fluid. Two days after the onset of *hemiplegia* the boy was able to move his right leg slightly, and six weeks after onset recovery was almost complete.

DIAGNOSIS.—C. R. Amies⁷ carried out observations on 10 sera from convalescent cases of severe small-pox in Calcutta and on 28 sera from cases of *variola minor*, and found that the elementary bodies of *variola* were agglutinated by the serum of these patients, whereas *vaccinia* elementary bodies were not agglutinated even in the highest concentration of such sera.

PROPHYLAXIS.—A. F. Cameron⁸ maintains that the benefit to public health from indiscriminate hospital isolation of small-pox is not commensurable with the expense involved, his grounds being as follows: (1) From Jan. 1, 1928, to Aug. 31, 1932, 12,807 patients were admitted to the Metropolitan Small-pox Hospitals; 35 died—a mortality of 0·27 per cent. In only 14, however, was small-pox the primary cause of death, and in 21 was at most a secondary or

adjuvant cause. In only 3 of the 14 cases was the attack of the severe toxic type, and of the remaining 11 fatal cases 4 were infants aged from 9 days to 5 weeks. (2) Out of a total of 6310 cases admitted between Nov. 1, 1929, and May 31, 1932, only 852 (13.5 per cent) required hospital treatment. (3) The minimum cost of removal and treatment in hospital of small-pox in London is not less than twelve shillings per case a day. Cameron does not think there is any likelihood of a sudden or gradual, or even an occasional, increase in the severity of the disease, and therefore suggests that public health would be fully protected by selection as opposed to indiscriminate segregation of cases of small-pox.

REFERENCES.—¹*Epidem. Rep. Health Sect. League of Nat.* 1932, 223; ²*Jour. Prev. Med.* 1932, vi, 273; ³*Small-pox in Egypt*, 1933; ⁴*Bull. Off. internat. d'Hyg. publ.* 1933, xxv, 604; ⁵*Arch. Dermatol. and Syph.* 1932, xxvi, 997; ⁶*Jour. Amer. Med. Assoc.* 1933, c, 817; ⁷*Lancet*, 1932, ii, 558; ⁸*Public Health*, 1932, xlvii, 50.

SNAKE POISONING.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Further work on the concentration and standardization of **Antivenom Serums** is recorded by E. Grasset¹ working in South Africa, where relatively large doses of highly potent serums are required on account of the large size of the numerous venomous snakes necessitating the use of specific polyvalent serums, as in S. America. The technical details of their preparation have already been recorded,² and the present paper deals with their clinical use. Equal concentrations of the anticolubrine and antiviperine elements have been obtained to fourfold the original strength, and by employing in their preparation detoxicated venoms, or 'anavenoms', stronger serums have been obtained in horses in four to six weeks than formerly in twelve to sixteen months, and concentrated pseudo-globulins to neutralize 6 mgrm. of cobra venoms and 35 to 75 mgrm. of puff-adder and night-adder venoms have been obtained. To get the maximum efficiency of diffusion in the system they advise using only a double concentration supplied in 10-c.c. ampoules equal to two such of the former weak product. The curative properties of this preparation have been tested in sheep, which are more susceptible than dogs, and the minimum doses causing death in 100-lb. sheep in different periods of time were first ascertained. The tests showed that the concentrated serum did exert twice the protective action of the unconcentrated in both the colubrine and viperine venoms. Next the influence of delay in treatment was investigated after the injection of a dose of cobra venom that killed the controls in five hours, and it was found that 7 c.c. of the double strength serum saved the animals after half an hour's delay; 14 c.c. were required after one hour, 25 to 30 c.c. after one and a half hours, and 40 c.c. after two and a half hours, by which time severe general or local symptoms of snake poisoning had developed. In the more resistant dog much smaller doses would be required. The influence of the application of a tourniquet three minutes after injection of the venom into a limb to retard its absorption was next tested, the ligature being left in position for thirty, sixty, and ninety minutes respectively, but relaxed momentarily at the end of each half hour to prevent necrosis. The retarding and localizing influence of the tourniquet was strikingly illustrated, for the curative doses were reduced from 30 c.c. and 14 c.c. without the tourniquet to 20 c.c. and 7 c.c. respectively with its application for one and a half and one hours, and twelve lethal doses were neutralized by 20 c.c. of serum with half an hour's application of the tourniquet, so that a massive dose of venom for such a sensitive animal as the sheep was successfully counteracted by a relatively small dose of serum.

Direct experiments of this nature cannot be performed on man, but from data of Calmette and others it is estimated that a fatal dose for a 180-kilo man would be about 15 mgrm. of dried cobra venom, of which one-third must be

neutralized to reduce it to below the minimal lethal dose, or half of a 20-mgrm. dose. The writer estimates that a 10-c.c. ampoule of the concentrated serum would suffice for 20 mgrm. and 20 c.c. for 40 mgrm. of dried venom, but relatively larger doses are necessary in children on account of their lower body weight. The concentrated venoms also keep better than the unconcentrated ones. Their practical value is thus greatly enhanced.

G. C. Maitra, B. P. B. Naidu, and M. L. Ahuja³ report on the technique of the concentration of antivenomous serums made in India, and they obtained better results by fractionating the pseudoglobulins with the aid of sodium sulphate, instead of ammonium sulphate, on account of more rapid dialysis, and they have thus effected a threefold, instead of a former twofold, concentration, and they hope to obtain still better results in time.

REFERENCES.—¹*S. Afric. Med. Jour.* 1933, Jan. 28, 35; ²*Trans. Roy. Soc. Trop. Med. and Hyg.* 1932, xxvi, 267; ³*Ind. Jour. Med. Research.* 1933, July, 229.

SPINAL BLOCK, DIAGNOSIS OF. *Macdonald Critchley, M.D., F.R.C.P.*

The Amyl Nitrite Test.—C. A. Elsberg and C. C. Hare¹ have devised a simple means of detecting compression of the spinal theca. The principle consists in noting whether a rise in intracranial pressure, produced by amyl nitrite inhalations, is transmitted or not to the spinal intrathecal cavity. Precise details of the technique are as follows: A lumbar puncture is performed and the initial manometric pressure noted. The patient is then directed to inhale the contents of a capsule of amyl nitrite for exactly 30 seconds, during which time readings of the spinal fluid pressure are taken every 5 or 10 seconds. In normal subjects a rise in the pressure is immediately observed, and the manometer continues to rise for a short period (15 to 60 seconds) after the inhalation of the drug has ceased. The pressure then falls gradually. The average rise during the period of inhalation was 90 mm., and the total rise during and after the inhalation 162 mm. The authors conclude from their experiences of 63 cases of suspected spinal block (including 13 positive cases) that the amyl nitrite test is a delicate method for determining the presence or absence of a block and the degree to which there is interference with the free flow of cerebrospinal fluid in the spinal subarachnoid pathway. The amyl nitrite test appears to be more sensitive than the Queckenstedt test (compression of the jugular veins). In 5 cases of complete block shown by the amyl nitrite test, Queckenstedt's test showed a partial block in 1 and a questionable partial block in 1. In 5 cases of partial block as shown by the amyl nitrite test, Queckenstedt's test gave a questionable result in 1 and an entirely negative result in 3 others. In 3 cases in which there was a marked block as shown by the amyl nitrite test, Queckenstedt's test showed a marked block in 1 and a complete block in 2 others. In every patient in whom there was evidence of a spinal subarachnoid block by the Queckenstedt test, a block was also demonstrated by the amyl nitrite test.

REFERENCE.—¹*Bull. Neurol. Inst. New York*, 1932, ii, 347.

SPINE, AFFECTIONS OF.

E. W. Hey Groves, M.S., F.R.C.S.

Spinal Fractures.—Severe injuries of the spine may be sustained without serious damage to the cord. The severity and nature of such injuries cannot be properly appreciated or treated unless good X-rays are taken at once. These must of course be taken in a lateral direction, because it is only by such a view that the compression fracture is observed. Many years ago Kümmell described a traumatic spondylitis in which deformity, pain, and lasting invalidity followed an injury. His observations were made before X rays were available and it was supposed that in 'Kümmell's disease' a mysterious

process of inflammation and absorption of the bodies of one or more vertebræ were caused by the injury of blood-vessels of the bones. But in recent years doubt has been thrown on this theory and it is generally believed that Kummell's disease is nothing more or less than a compression fracture of the vertebræ, usually in the region of the last dorsal or the first lumbar. The apparent latency of the disease and the increase of the deformity and symptoms are explained by the facts that after the original injury the patient is kept at rest, which lessens the pain, whilst the deformity is unobserved in the prone position or obscured by swelling of the soft parts. After some weeks of recumbency, when the patient gets up pain becomes severe, and it is noticed that the lower dorsal spinal process is projecting.

Every case of severe spinal injury should be submitted without undue delay to X-ray examination. This is especially important when there is marked tenderness over the junction of the dorsal and lumbar spines. It will then be noticed that one or two of the vertebral bodies have been compressed in a vertical direction so as to present a wedge-shape. No time must then be lost in correcting the displacement and in fixing the spine in correct position. A. G. Davis¹ in America, L. Böhler² in Vienna, and R. Watson Jones³ in this country have been the advocates of the method of treatment by hyperextension and plaster fixation. The injury is always caused by a forcible flexion of the spine, and the deformity produced is a kyphosis. The treatment therefore involves forcible hyperextension with an attempt to produce lordosis. If this is done within one or two weeks of the injury, it is possible actually to disimpact the compressed vertebral body. But even at a much later date it is possible to correct the kyphos and to obtain correct alinement of the vertebral column as a whole.

In obtaining reduction of the deformity the first problem is that of adequate anaesthesia. This is usually obtained by local injection of 1 per cent novocain between the spinous processes, and by paravertebral puncture. But it is also possible to use a general anaesthetic, which will permit of forcible manual reposition of the kyphos whilst the patient is slung up by a sheet from his head and his heels. If the local anaesthetic is used, the patient lies on his face with the legs supported on a low table and the head and shoulders on a higher one. A plaster-of-Paris case is then moulded on to the whole trunk with nothing more than a stockinette vest over the skin. The case is moulded on to the brim of the pelvis below and up to the armpits and the body of the sternum above, so as to maintain the whole spine in a position of hyperextension or lordosis. If the reduction is satisfactory and the plaster has been properly applied, the patient should be able to sit up without pain within a few days.

F. Jimeno-Vidal⁴ supplies further details of Böhler's practice (*Plate XLVII*). The patient is not kept in bed, but gets up after a few days. Then each day he is made to do various exercises with the arms and the legs in a systematic manner, and when he is able to walk without assistance, he carries weights from 5 to 25 kilos on his head. All these exercises are with a view to preserving and increasing the muscle power, whilst the weight-bearing gives muscle balance to the spine in the erect position. The plaster case is worn for at least twelve weeks, and when it is removed no spinal brace is necessary.

Geoffrey Jefferson⁵ fully endorses the principles laid down by Watson Jones and Böhler, and also describes a useful method of dealing with certain cases of dislocation of the cervical spine. If seen at once, these cases can be treated by traction and manipulation under anaesthesia. Later it may be impossible to carry this out fully, and then continued traction is of value. A well-padded collar surrounds the patient's jaw and occiput. Straps from this pass up, one pair in front and the other behind the ears. They are fastened to the top of

the bed. A firm pillow or sand-bag is placed under the shoulders so that the neck is hyperextended. The bed-head is raised on two chairs so that the body weight acts as efficient traction. This position is maintained for one hour. Then the bed-head is lowered on to blocks about one foot high and so maintained for about three days. **Morphia** is necessary in the early part of this treatment, and some difficulty may be experienced in feeding the patient.

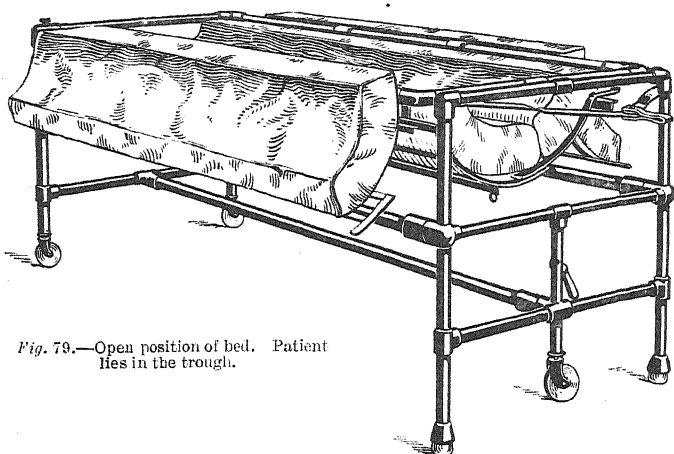


Fig. 79.—Open position of bed. Patient lies in the trough.

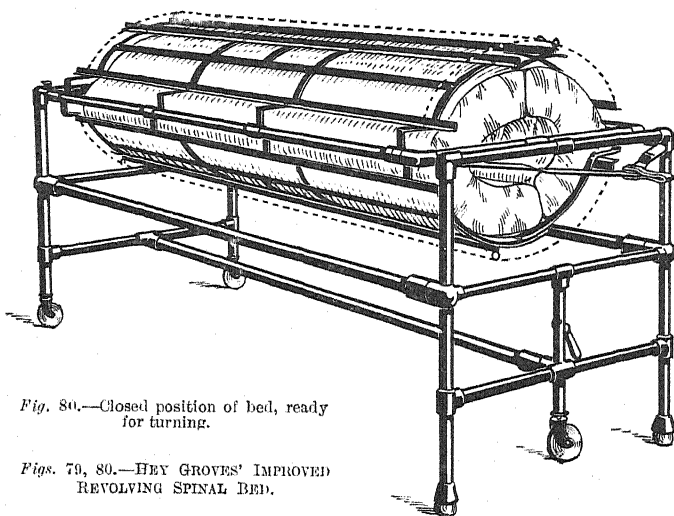


Fig. 80.—Closed position of bed, ready for turning.

Figs. 79, 80.—HEY GROVES' IMPROVED REVOLVING SPINAL BED.

After three days a plaster cast is applied to the neck, maintaining the fully extended position.

Fractures of the Spine with Cord Injuries.—These terrible conditions afford only a very slender hope of anything more than amelioration. The problem of whether it is worth while to do a laminectomy in apparently complete

spinal-cord lesions will always be a very difficult one. It is easy to dismiss the matter by a definite negative, but in any individual case two considerations will always occur to the surgeon's mind, and often to the patient himself. One is the remote possibility of finding and removing some definite pressure on the cord, and the other is that when months have elapsed and the patient realizes his helpless condition, he will be tortured by the regret that nothing was attempted at the time of the accident. For these reasons it would seem expedient to operate on many cases, but especially on those where the X rays (lateral view) show there is gross dislocation of the vertebra.

Whether operation is done or not, the difficulty of nursing such patients under ordinary circumstances is very great. There is an imminent danger of bed-sores, and yet to turn the patient is painful and dangerous. A plaster bed and a turning-case require great skill and experience in the making and fitting, and even then it requires three or four people to do the daily turning.

All these difficulties can be overcome by the use of the revolving spinal bed designed by E. W. Hey Groves some years ago. (See MEDICAL ANNUAL, 1931, p. 444). Recently⁶ he has described an improved pattern of the spinal bed. In this the bed is trough-shaped and made of two hinged halves (*Figs. 79, 80*). The patient lies in the trough, and when he has to be turned, he is cased in by front hinged pieces covered with mattresses. Then he lies perfectly snug, and the whole cage containing the patient can be turned over, the posterior pieces hinged aside, and the patient's back fully exposed. The novelty of this design consists in the oval shape of the transverse section, instead of its being quadrilateral. This makes it possible to fix the patient's body firmly when he is being turned, and, moreover, the size of the oval can be adjusted to fit a thin or a stout patient without the use of a number of pillows.

Deformity of the Lumbosacral Spine associated with Sciatica.—The pathology and causation of sciatica is still very far from clear; but evidence is slowly accumulating that shows many cases to be associated with and possibly caused by abnormalities in the lumbosacral bones and joints. Paul Williams⁷ has shown that when accurate lateral X-rays are taken about 90 per cent of cases of chronic sciatica show definite changes in the bones and

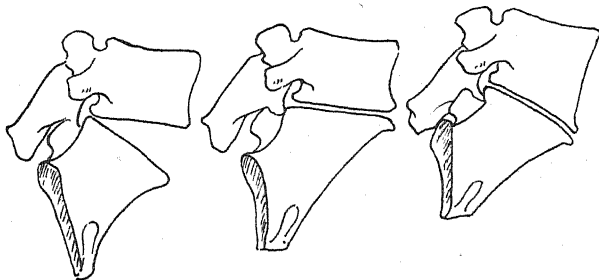


Fig. 81.—The three most common appearances of the lesion as shown by the X rays, depending on the tilt of the superior articular surface of the first sacral and inferior articular surface of the fifth lumbar vertebra.

(*Figs. 81, 82 re-drawn from the 'Journal of the American Medical Association'.*)

joints of the sacral region. Of these, the great majority exhibited a very marked diminution of the joint space between the 5th lumbar and the 1st sacral vertebra. No doubt this appearance is often due to a destruction of the intervertebral disc and is associated with osteo-arthritis; but trauma and static causes also play their part. However brought about, this malposition

of the lumbosacral joint is capable of producing irritation and pressure of the 5th lumbar and the 1st sacral nerves as they emerge from the thecal canal in this region (*Figs. 81, 82*).

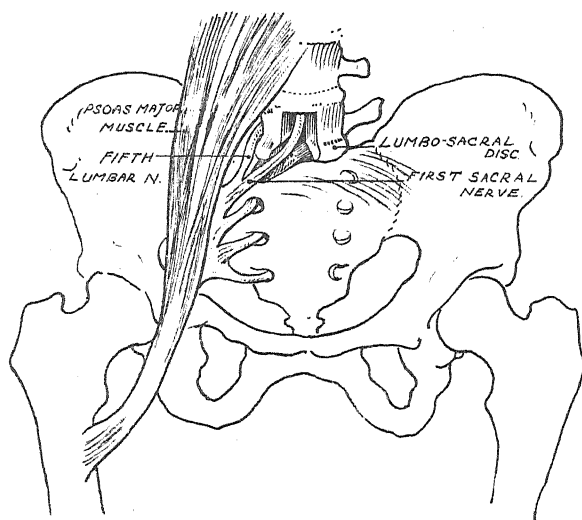


Fig. 82.—Relationship of psoas muscle, fifth lumbar nerve, and first sacral nerve to lumbosacral intervertebral disc. (Drawing from anatomic specimen with a section removed from the fifth lumbar and first sacral vertebra, exposing the neural canal.)

The treatment demanded by this condition consists in some form of immobilization. In the great majority of the 109 cases this was effected by some form of plaster case, followed by suitable corsets. In six cases a spinal fusion was done with good results.



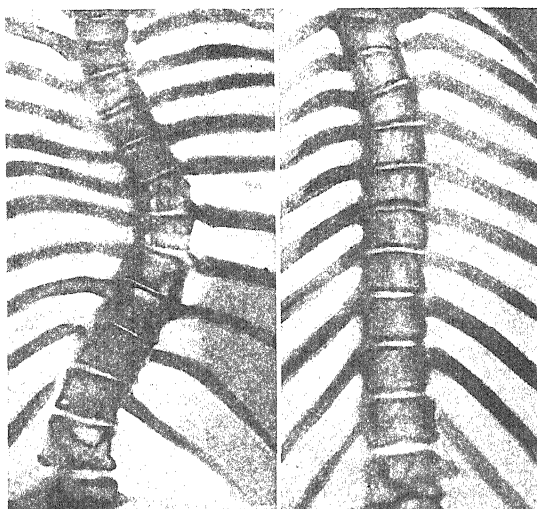
Fig. 83.—Galeazzi method of treating scoliosis. Cast almost complete, showing traction bands still *in situ*.

Scoliosis.—The treatment of scoliosis has always been, and will remain, the most difficult problem in orthopaedic surgery. From time to time, however, the subject is taken up afresh by an enthusiast and some new method is devised. All such methods in recent years have consisted essentially in forcible and gradual correction of the deformity and fixation by plaster-of-Paris. The latest and most successful of these has been introduced by Galeazzi, of Milan, and is reported on most favourably by P. Lewin,⁸ of Chicago. First of all, the rigid spine must be mobilized by a long course of manipulation and wrenching, the latter being done by the apparatus which is used for the final correction. The apparatus (which costs \$1000) consists of two pieces of mechanism, one

which fixes the pelvis and the other the shoulder girdle. Each of these can be rotated round a vertical or a horizontal axis. The patient stands on a platform and stoops down so that the back is horizontal, in the position of a quadruped. The pelvis is then surrounded by a plaster case which comes down to the level of the trochanters. The shoulder-girdle is fixed by another plaster case. The two extremities of the spine are then de-flexed and de-rotated so as to correct the deformity as far as possible. Two bandages are passed round the trunk on opposite sides and pulled upon by assistants, so as further to straighten the spine (*Fig. 83*). A third plaster bandage is placed so as to connect the shoulder and pelvic pieces. Windows are cut in the plaster jacket opposite to the concavities of the curves. The plaster is worn for about three months, when it is renewed in the same manner. Cure is effected in about twelve to thirty-six months (*Fig. 84*). Whether such

Fig. 84.—Skiagrams of patient with rigid structural scoliosis corrected in the Galeazzi apparatus.

(*Figs 83, 84 by kind permission of 'Surgery, Gynecology, and Obstetrics'.*)



a cure is permanent may be open to doubt, and Galeazzi usually employs celluloid cases after the cure is complete for permanent wear. This probably represents the best and most elaborate method of correcting scoliosis, and it almost justifies the attitude of most surgeons and patients in considering that the disability of the deformity is better than the treatment.

REFERENCES.—¹*Jour. Bone and Joint Surg.* 1929, xi, 133; ²*Arch. f. klin. Chir.* 1932, Oct., 842; ³*Brit. Med. Jour.* 1931, i, 300; ⁴*Presse méd.* 1933, May 10, 752; ⁵*Practitioner*, 1933, March, 332; ⁶*Brit. Med. Jour.* 1933, ii, 53; ⁷*Jour. Amer. Med. Assoc.* 1932, Nov. 12, 1677; ⁸*Surg. Gynecol. and Obst.* 1933, Jan., 79.

SPIROCHÆTOSIS ICTEROHÆMORRHAGICA. (*See JAUNDICE, SPIROCHÆTAL.*)

SPLEEN, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

Indications for Splenectomy.—There was a debate on the surgery of the spleen at the 1932 meeting of the British Medical Association,¹ at a joint meeting of the physicians and surgeons. Lord Dawson of Penn affirmed his belief that three diseases, and three only (excluding injury and rare conditions such as tumour), warrant removal of the spleen. These are acholuric jaundice,

purpura hæmorrhagica, and splenic anæmia. The ideal age for the first is about twelve, before massive adhesions have developed. If there are biliary symptoms, it is better to attack the spleen first and the gall-stones at a later date. Blood transfusion before operation may be dangerous from agglutination in spite of careful grouping. The results from purpura hæmorrhagica may be brilliant, but the diagnosis must be sound—recurrent bleeding, delayed retractility of clot, diminished platelet count, and a positive capillary resistance test. Aplastic anæmia shows purpura and thrombocytopenia, but the anæmia is more profound. **Blood Transfusion** before operation is valuable in these cases. In splenic anæmia the results are scarcely so good, on account of the hepatic cirrhosis.

Lord Moynihan² followed with an account of the history of the operation, beginning with a case in Italy in 1549. He then passed in brief review the conditions for which it may be performed: rupture, movable spleen, torsion or prolapse, malaria (only if mobile), syphilis, cysts or tumours, and the three diseases above dealt with. Concerning splenic anæmia, he said: "There are few, if indeed there are any, operations in surgery which require such careful preparation of the patient." If the spleen is very large, its size must be reduced by **X Rays**, or, better, by **Radium**, which may in a few weeks cause a spleen that almost fills the abdomen to retreat nearly to the costal margin. The anæmia must be remedied by one or more **Blood Transfusions**. There is no hurry; a couple of months may be well spent in preparation.

Delayed Hæmorrhage with Rupture of the Spleen.—A. H. McIndoe,³ of London, relates a case which he observed at the Mayo Clinic of delayed hæmorrhage following injury of the spleen, and presents a literature study of

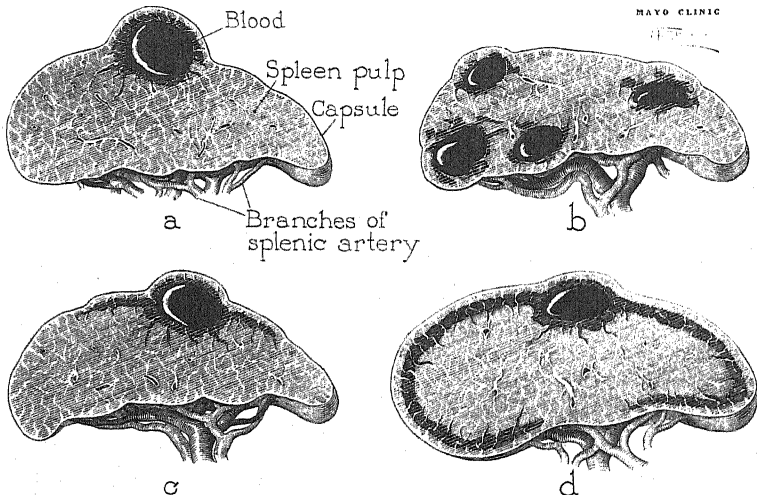


Fig. 85.—a, Intrasplenic hæmatoma—solitary 'blood cyst'; b, Multiple intrasplenic hæmatomata; c, Intrasplenic hæmatoma with moderate subcapsular hæmorrhagic extravasation; d, Intrasplenic hæmatoma with complete subcapsular extravasation. (Figs. 85, 86 by kind permission of the 'British Journal of Surgery'.)

46 cases. The patient whose history is given had a not very severe blow over the left upper abdomen, followed by severe pain off and on for a day; then he was well and at work seven days. On the ninth day violent pain returned,

with all the signs of intra-abdominal hæmorrhage. A huge hæmatoma had formed under the capsule of the spleen, which had burst. **Splenectomy** saved his life. In the series studied, the latent period was from two to six days in 23 cases, seven to eleven in 12, up to three weeks in 7 more, and over three weeks in 3. During this latent period, though the patient may go to work, there is often a persistent dull ache over the spleen and slight rigidity of the muscles of the upper left abdomen. Costal breathing, left basal pleurisy, and leucocytosis have all been noticed in a few cases, also fainting spells. The final hæmorrhage comes on suddenly, with agonizing pain and collapse; 7 patients died before treatment could be undertaken. In half the cases there was a blood cyst in the spleen which had ruptured; in the others a perisplenic hæmatoma had formed (Figs. 85, 86). In one instance the surgeon made a diagnosis during the latent period, and removed the spleen. Of the cases reported, 27 per cent died after operation. [No doubt the true mortality is higher. Unpublished fatal cases have occurred within the knowledge of most surgeons of experience.—A. R. S.]

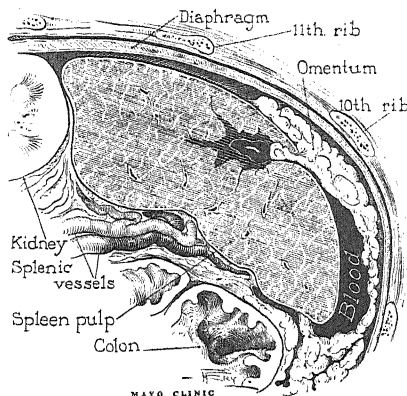


Fig. 86.—Capsular and parenchymal rupture with small perisplenic hæmatoma. Rent plugged with blood-clot and omental tongue.

after operation. [No doubt the true mortality is higher. Unpublished fatal cases have occurred within the knowledge of most surgeons of experience.—A. R. S.]

Purpura Hæmorrhagica.—R. Maingot⁴ has removed the spleen twelve times for this ailment, and lost only one patient. He says he has never seen preliminary blood transfusion do anything but harm. E. L. Eliason and L. K. Ferguson⁵ publish the following conclusions: (1) A review of the literature points to the fact that purpura hæmorrhagica is a disease causing not only a reduction of blood-platelets but also a disturbance of the entire reticulo-endothelial system; (2) It has not yet been proven that the spleen is the organ at fault in purpura hæmorrhagica; (3) Splenectomy appears to be the most effective method of controlling extensive hæmorrhage in purpura hæmorrhagica of either the acute or recurring type; (4) Early operation and adequate preparation of the patient by transfusion is imperative; (5) Removal of foci of infection is the best prophylaxis against recurrences; (6) Five additional cases of purpura hæmorrhagica with splenectomy are reported; (7) A review of the results obtained in 213 reported cases has been made; (8) The operative mortality for the whole group was 13.1 per cent, but in the cases collected from the last four years the mortality is only 7.08 per cent in 113 cases; (9) In acute purpura, there were 35 cases treated by splenectomy with 12 deaths, 34.3 per cent. In the last 22 cases there were only 3 deaths, 13.6 per cent. In the chronic purpuras there were 160 cases with 11 deaths, 7 per cent.

Splenic Anæmia.—In a number of cases splenectomy has been followed by fatal thrombosis of the splenic vein extending into the portal vein, especially in those patients who have a normal or high platelet-count. Graham Bryce⁶ records one fatal case, and suggests **Ligature of the Splenic Artery** instead of splenectomy.

REFERENCES.—¹*Brit. Med. Jour.* 1932, ii, 305; ²*Ibid.*, 701; ³*Brit. Jour. Surg.* 1932 Oct., 249; ⁴*Med. Press and Circ.* 1933, June-July, 519, 4; ⁵*Ann. of Surg.* 1932, Nov., 801; ⁶*Lancet*, 1932, ii, 1423.

SPONDYLITIS DEFORMANS. (*See RHEUMATIC DISORDERS, CHRONIC.*)**STAMMERING.***H. St. John Rumsey, M.A.*

Explanation of Stammering.—The well-known fact that a stammerer, if musical, can nearly always sing without difficulty, provides the solution to the whole trouble, and for this reason. *The singer subconsciously 'thinks in terms of vowels' while the stammerer 'thinks in terms of consonants'.* While singing, the voice tone is carried through continuously and smoothly; but since the voice tone is heard almost exclusively in the vowels, it is obvious that a singer's whole attention is directed to vowel (and voice) tone formation, while the consonants are left to look after themselves. In sharp contrast with this is the stammerer's habit of keeping his chief attention on the consonants. This is proved by the fact that most stammerers will volunteer the information that their chief difficulties are encountered in words beginning with *b/p* or *k/g*. Others will find difficulties in words beginning with *f/v* or *s/z*. An appreciable number will say that they cannot utter a word beginning with a vowel, but even here the difficulty arises still from not having *thought of* the vocal tone.

Phonation, or the production of vocal tone, is accomplished by a combination of muscular efforts just as much as the lifting of a weight or the throwing of a cricket ball. In throwing a ball the direction and distance are calculated mentally, and the muscles do the rest—with amazing accuracy, after a little practice. To expect a vocal sound while the mind is concentrated on a consonant is quite unreasonable. This explains the inability of a stammerer to say 'king' if his attention is concentrated on the *k*. If he were singing, his chief thought would be to get a vocal tone on the 'short *i*', and that tone would be on a definite pitch, which we call a note, and the note would have a definite time value. No one could possibly sing a musical note without giving a great deal more attention and thought to it than the average stammerer does to the vowels of the word he is trying to say. As we have seen, most of his attention is focused on the initial consonant, and the stammerer's exaggeration of a consonant is generally in proportion to the thought and effort he has given to it.

With the stammerer who cannot begin with a vowel, the principle is the same; it is lack of clearly 'thinking the tone'.

Vowel Formation.—To make a vowel it is necessary to phonate with the larynx into a definite 'mouth shape'—for instance, a very widely opened mouth for *ah*, and a very long and narrow shape for *oo*, using the lips to lengthen the 'mouth shape', or a very flat shape for *ee*; here the lower jaw is pushed forward to enable the tongue to be brought forward and raised so as to provide a 'false bottom' to the mouth and so make it shallow or flat. The stammerer who cannot begin with a vowel *has* thought of the vowel shape, but he *has not* mentally visualized the tone to be sent through that 'vowel shape'. A stammerer makes his own difficulty by not thinking of what he is trying to do, yet he would not expect to throw a cricket ball if he was thinking of tying a knot in a piece of string! Having concentrated all his energies on the consonants, which are also formed by 'mouth shapes', and having forgotten all about the phonation of the vowels, the stammerer naturally develops the habit of 'sticking' on the consonants; thus he comes to imagine that he has a difficulty in forming consonants. As a matter of fact, he can not only form them, but he quickly acquires the habit of overdoing it, and so making too much effort and moving and shaping his mouth too much.

Having formed the idea that consonants are his difficulty, he makes more and more effort, until it becomes very difficult for him to speak; then follows

the anticipation of failure, and so a vicious circle is established and we have what is known as the 'nervous stammerer'.

That the real difficulty is made by failure mentally to visualize the vocal sound is corroborated by these facts:—

1. As noted above, the stammerer can sing fluently.

2. A stammerer can imitate a dialect. Now, what we call a 'dialect' is really a particular way of pronouncing *vowels* which is abnormal to us. Therefore to imitate the dialect of another county it is necessary to concentrate on vowels all the time, and the moment that concentration is relaxed, the dialect is lost.

3. A stammerer can frequently take part in a theatrical performance, because on the stage it is necessary to employ a firmer tone than in ordinary conversation. This forces the mind to concentrate on tone production.

Ninety-nine per cent of stammerers can speak fluently as long as they concentrate on the vowels *and the tone used in the vowels*. The stammerer must make up his mind to exaggerate his vowels; he must remember and realize that he has formed the habit of too little attention to vowels and vocal tone—in other words, he has formed the habit of 'clipping' all his vowels. He will do well to try to exaggerate all vocal sounds in his speech, not that they are really exaggerated, but only so in comparison with his habits of neglecting them.

Some stammerers are reluctant to change their voices; they feel self-conscious about any such change. It is quite impossible to eradicate a stammer by any other method; the stammerer who wishes to keep his voice had better make up his mind to keep his stammer as well.

Value of Good Tone.—While on the subject of vocal tone and vowels it is well to realize that the average speaker makes too little of vocal tone, although individuality in speech, beauty of speech, rhythm, and correct stress and cadence all depend on due attention to vocal tone. It is not too much to say that anyone who would be described as a good speaker and pleasant to listen to has more than average vocal tone, with consequently increased vowels.

The Vowel Stammerer.—So far, we have considered what may be called a 'simple stammer', the symptoms of which are a tendency to 'stick' on the consonants or inability to begin a vowel; in all such cases absolute fluency can be attained by careful and consistent concentration on vocal tone. Occasionally there are found cases of vowel stammerers—that is to say, stammerers who go on repeating the vowel just as the most usual type of stammerer repeats the consonant. The latter says 'k-k-k-k-king', but the former says 'c-ar-ar-ar-art'. In my own experience I have never met with a vowel stammer only, the more usual type being always present as well. This being so, it is obvious that such a 'double' stammer is very difficult to correct. With the simple consonant stammer, the remedy is to think in terms of vowels—as stated above—to concentrate on the vocal tone, to think of the 'tune of the sentence' rather than the words of it. As long as the patient is 'on vowels' he will speak fluently, *just as surely as he will be fluent when he sings*.

When the vowel stammer is also present, vowels, instead of offering safety, present another set of difficulties, as is proved by the fact that a vowel stammerer cannot sing without stammering, although he will stammer very much less than when he speaks. The reason for this added fluency is that, when singing, the *time value* of the vowels is decided by the music, whereas the vowel stammerer apparently has no idea of *time value* or what we should more ordinarily describe as *rhythm* in speech. The only treatment on the lines of elocution possible is very close and detailed attention to the 'time values' of every vowel—in other words, it entails *learning to speak* all over again from

the start, gradually building up sentences with all the correct time values or rhythm. It can be done and has been done, but it is a long and tedious business, and it would always be wise to consult a nerve specialist as well as a remedial elocutionist.

The Nervous Stammerer.—In cases of 'simple stammering' the remedy is simple, but there are cases where the stammer has so affected the sufferer that it has set up other complexes, and in such cases it is wise to combine both types of treatment, nerve and elocution, for the following reason.

When once the patient has become a 'nervous stammerer'—that is to say, *when his failures are due as much to anticipated failure as to clipped vowels*—the help of the nerve specialist is an advantage inasmuch as it builds up confidence in the possibility of a cure and in the simple elocutionary method to be followed. My personal experience goes to show that a nerve treatment without elocution will *never* effect a permanent cure, *because the clipped vowel habit is still there*, and until that habit is eradicated the stammer is still imminent. I have come across scores of cases in which stammering has been 'cured' by suggestion *for a few months*, but it has come back in a more severe degree than before. I am not claiming that there are no cases in which the cure has been permanent—naturally such cases would not come under my notice; it is only the failures that come to me! It is obvious that if the 'speech fear' has not got a strong hold on the sufferer, elocution will effect a cure without the aid of nerve treatment, and cure by elocution always lasts unless the sufferer allows himself to grow careless.

The elocution cure is gradual and it takes time, but it has the advantage of being permanent and of building up the self-confidence of the stammerer—in other words, he treats himself by auto-suggestion.

Schools of Elocution.—It is necessary to say a word of warning about elocutionists. A large number of schools of elocution are really theatrical training schools; English literature, stage dancing, gesture, and a hundred other matters are dealt with, all of which are of great assistance to would-be actors, but such training will not benefit the stammerer in the slightest degree. On the contrary, such a course will merely suggest to him that elocution is not going to help him in any way, which is an absolutely false idea, because elocution that really is genuine elocution, a real study of speech, will effect a cure.

There are, too, the elocutionists whose idea of elocution is to emphasize all consonants; this type is now dying out, but twenty or thirty years ago elocution meant 'consonant training', and many have had to listen to recitations by so-called elocutionists where the result was not artistic and was not even pleasant to listen to.

Elocution for the stammerer must be on the lines of voice training and vowel training; any other type will do more harm than good.

Some 75 per cent of stammerers seem to lack determination, but whether this is the result of an inferiority complex set up by the stammer or not it would be difficult to say. The fact remains that it is very important to stress the point from the first that the stammer has to be cured by the stammerer himself, that the elocutionist can only point out the way and criticize, but the speech control has to be accomplished and established by the patient. In cases where there is no deficiency of determination it is often very strongly developed, and I have come across cases where a dozen lessons over a period of a couple of months have effected a cure.

Time Required.—The average patient should take three lessons for the first week or two, and two lessons for the next two or three weeks; after that he should be able to do with one lesson a week, and, as he becomes

established, he should drop gradually down to an occasional 'tune up' once in four to six weeks. It is impossible to lay down definite rules, as everything depends upon the stammerer's ability to imitate the vowel rhythm of the elocutionist and to practise it until it becomes his own. It is clear, therefore, that the number of actual lessons depends on the patient's musical ear, sense of rhythm, and, most of all, on his determination to cure himself.

Occasionally cases are found where the stammerer clings to his disability in order to avoid social intercourse or work. In the former instance much will depend upon whether shyness is the result of the stammer or not. Everyone has met with shy people who have no stammer but who will avoid meeting fresh people whenever it is possible. Such deep-seated shyness may be treated by suggestion, because, until the wish to avoid people is overcome, there must still be the temptation to use the stammer as a protection. Lazy stammerers will avoid cure if a cure means the starting of regular work of a type which makes no appeal. Needless to say this type is met with among sons of wealthy parents; I remember a case where a young man spoke fluently when playing lawn tennis or cricket, but stammered badly whenever stocks and shares were mentioned. In such a case a little plain speaking is needed!

The first step is to win over the stammerer to work with his instructor, and to make him realize that the reputation of the teacher rests with him, and that any slackness is unfair. After the mental attitude towards a cure has been established, then it is a case of vowel training and vowel drill till fluency is attained.

English Vowels.—In this all-important factor of vowel-drill, stammerers, and, for that matter, all serious students of elocution, are severely handicapped by the shortage of letters to represent the English vowel sounds. With only five or seven letters we have to represent as many as twenty-four different vowel sounds, of which eleven are 'simple', ten are diphthongs, and three are triphthongs, as follows:—

SIMPLE.

1. EE as in Seat	7. o as in Hop
2. i " " Pig	8. AR " " Ark
3. e " " Leg	9. OR " " Cord
4. a " " Can	10. ER " " Hurt
5. OO " " Boot	11. u " " Cut
6. oo " " Foot	

DIPHTHONGS.

1. A and i as in Tale	6. u and oo as in Loud
2. e and ER " " Hair	7. OR and i " " Hoist
3. O and OO " " Home	8. i and ER " " Hear
4. i and OO " " Tune	9. oo and a " " Moor
5. u and i " " Night	10. i and u " " Beard

TRIPHTHONGS.

1. i and oo and u as in Cure
2. u and oo and u " " Tower
3. u and i and u " " Fire

Opinions vary somewhat on the question of the English vowels, but several well-known authorities agree in saying that there are thirteen different vowels; these are made by taking my eleven simple ones and numbers 1 and 3 of the diphthongs. All the others in my list are combinations of what have already been listed, so in actual fact I am in agreement with the authorities who quote a total of thirteen; I have described the diphthongs and triphthongs in detail because, as I have tried to show, vowel study and vowel drill provide the only method by which the stammerer can attain fluency.

Vowel Drill.—The stammerer should work through the list carefully, making a *clear distinction* between all the vowel sounds; he should then read a short passage from a daily paper, taking care to use the same vowel distinction. The ideal routine of practice would be three minutes in every half-hour during the day; this, however, would not be possible for many people, but they should get as near to it as they can. The most important time in the whole day is a careful practice before breakfast. It cannot be too clearly understood that it is all a matter of 'tuning in' on vowels, so the more frequently that 'tuning in' is practised, the sooner the bad habit of 'consonant speech' will be overcome. The early morning practice not only tunes in the stammerer but also serves to remind him that *he can speak as long as he pronounces his vowels carefully*.

A stammerer should realize that he can only stammer on a distorted word, whereas if his vowels are truly pronounced, he will be fluent.

Vocal Tone.—At all times a stammerer should use a full and firm tone of voice, making good use of chest and nasal resonance. Most stammerers speak too quietly and must make up their minds to speak out more.

Speed.—It is of vital importance to speak slowly. It is essential for the stammerer to speak slowly and firmly at all times.

Breathing.—Much bad advice is given on this point, especially by well-meaning schoolmasters who tell stammerers to take a very deep breath before speaking. An extra deep breath merely adds to the difficulties the stammerer already has to contend with. Anyone who has enough breath to play ordinary games has more than enough breath for speech. "Take only as much breath as you can comfortably manage" was the advice of one of the best voice-trainers of all time.

STAPHYLOCOCCUS INFECTIONS. J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—G. Suarez¹ reports four cases of *staphylococcal septicæmia* in patients aged from 30 to 52, two of which were fatal, while two recovered after a protracted illness. In three the condition was secondary to furunculosis and in one to an abscess at the site of a cholecystectomy wound.

E. B. Raymond² has collected ten cases of *staphylococcal epididymitis* in patients aged from 21 to 50. *Sta. pyogenes aureus* was usually found to be the causal organism, the epididymis being infected by the blood-stream, or the urinary or urogenital tract. Acute staphylococcal epididymitis usually arises in the course of an acute staphylococcal infection, and presents the clinical symptoms common to all acute inflammations of the epididymis. It is important to distinguish chronic staphylococcal epididymitis from tuberculous infection, as the course of staphylococcal epididymitis is constantly favourable, in striking contrast with that of tuberculous epididymitis.

R. A. Schless³ suggests the following classification of *staphylococcal meningitis*: (1) A localized abscess involving the meninges and caused by extension of suppuration from neighbouring structures; such cases can be cured by operation. (2) Meningitis arising in the course of generalized staphylococcal septicæmia, the outcome being invariably fatal. (3) Meningitis of hæmatogenous origin, most frequently secondary to staphylococcal infection in distant parts of the body; no recovery has been reported in such cases. (4) Exceedingly mild meningitis, of which one case only was reported in 1928 by Lamb, in which recovery followed the use of gentian violet.

TREATMENT.—C. E. Dolman⁴ treated 28 patients with intractable, persistent, or recurrent staphylococcal infections, including 16 cases of boils, by subcutaneous injection of a **Toxoid** prepared from several strains of staphylococci selected for their high toxigenicity. Improvement followed by cure ensued

shortly after commencement of the treatment in each case, and was accompanied by an increased titre of circulating antitoxin.

Schless³ reports a case of staphylococcal meningitis following a boil on the back in a boy, aged 13, in which rapid improvement and recovery took place after intrathecal injection of 5 c.c. of **Staphylococcus Aureus Bacteriophage**. This is the first case on record of intrathecal injection of bacteriophage.

Suarez's¹ patients were treated by intravenous injection of a **Specific Poly-valent Vaccine**.

Raymond² points out that unlike tuberculous epididymitis staphylococcal epididymitis with very rare exceptions requires medical treatment only.

(See also SKIN, PYOGENIC INFECTIONS OF; WOUND TREATMENT BY BACTERIOPHAGE.)

REFERENCES.—¹*Med. ibera*, 1933, xxvii, 830; ²*Thèse de Paris*, 1932, No. 570; ³*Amer. Jour. Dis. Child.* 1932, xlii, 813; ⁴*Jour. Amer. Med. Assoc.* 1933, c, 1007.

STERILITY, MALE. (See TESTIS, SURGERY OF—VAS DEFERENS.)

STOMACH. (See also GASTRITIS; GASTRIC AND DUODENAL ULCER; HEMATEMESIS; LEATHER-BOTTLE STOMACH.)

STOMACH, CANCER OF.

A. Rendle Short, M.D., F.R.C.S.

According to the late R. P. Rowlands,¹ cancer of the stomach kills 10,000 persons annually in England and Wales. It is so insidious that less than 30 per cent of the cases come to the surgeon early enough for a resection. There are, however, some encouraging features. Rowlands related one case alive and well seventeen years after resection, another eleven years, and a third well six years after operation for cancer of the stomach and colon. [A case of mine is well fourteen years after operation.—A. R. S.] The special tests for cancer of the stomach are not to be trusted implicitly; the gastric juice may be normal, and only after repeated X-ray examinations may a filling defect or an ulcer-crater be shown up. Rowlands repeated what has often been said before that to wait till cancer of the stomach is *proved* is to lose most of the cases; if the symptoms are not better in two months, an exploratory laparotomy should be done.

H. K. Grey,² reporting from the Mayo Clinic, writes still more cheerfully. Of 373 cases resected for cancer of the stomach, 128 were alive over ten years, 145 over five years, and 100 died within a year. An attempt to elucidate the factors that make for a good or bad prognosis showed that age, sex, and condition had no influence, nor had the site of the growth. Anacidity was unfavourable, so was a short history, indicating an active growth. E. Seifert³ has also noticed that anacidity is associated with a more than doubled mortality. Two papers by G. Gatewood,^{4,5} of Chicago, analyse the symptoms and the results in 417 cases. Pain was much the commonest *first symptom*; fullness, weakness, indigestion, anorexia, vomiting, and loss of weight followed in that order, then dysphagia, or diarrhoea. Hæmorrhage was the first sign only twice. Occult blood was found in the stools in 95 per cent cases; achlorhydria in 73 per cent. There were 85 gastro-enterostomies with a mortality of 25.9 per cent, and 58 resections with a mortality of 32.6 per cent. Of these 17 survived a five-year period, but 5 of them eventually recurred. R. Freidrich,⁶ referring to Seifert's observation as to the increased risks of operation in patients with achlorhydria, mentions that in Vienna they have lately been giving diluted **Hydrochloric Acid** for a week before the operation.

REFERENCES.—¹*Brit. Med. Jour.* 1933, i, 905; ²*Ann. of Surg.* 1933, June, 882; ³*Zentralb. f. Chir.* 1932, Oct., 2386; ⁴*Ann. of Surg.* 1932, Oct., 588; ⁵*Surg. Gynecol. and Obst.* 1933, Feb., 442; ⁶*Zentralb. f. Chir.* 1933, April, 801.

STOMACH, SURGERY OF. (*See also* GASTRIC AND DUODENAL ULCER, SURGERY OF; STOMACH, CANCER OF.) *A. Rendle Short, M.D., F.R.C.S.*

Gastroptosis.—The operation of slinging up the atonic stomach has not obtained a secure foothold in this country, but articles on the subject from Continental Clinics have been noticed from time to time in the *MEDICAL ANNUAL*. Professor B. O. Pribram,¹ of Berlin, argues in favour of it, and mentions that he has operated on 24 cases. Of 13 followed up, 8 were well and 5 better. Some have been followed over seven years. Radiograms are presented showing the stomach shadow greatly reduced after operation. The method is to sling the stomach by reefing stitches of silk to the diaphragm beneath the lower costal cartilages.

Benign Tumours.—Approximately a thousand cases have been observed within recent years. The tumour is usually in the pyloric region. There are often ulcers as well. The symptoms are not distinctive. There may be dyspepsia, vomiting, or hæmatemesis. Blood is nearly always present in the stools. Sometimes there is intermittent pyloric obstruction. The diagnosis has often been made from the filling defects in the barium skiagram; especially characteristic is a circular filling defect in the duodenal bulb associated with a six-hour residue in the stomach, indicating a polyp prolapsed through the pylorus. A **Partial Gastrectomy** is necessary for cure. These particulars are derived from a paper by G. P. La Roque and E. L. Shiflett,² of Richmond, Virginia.

Lymphosarcoma.—According to D. Cheever,³ of Boston, there have been 9 cases in his hospital in nineteen years, and 7 more of lymphosarcoma of the intestines. There is usually a palpable tumour. The symptoms are like those of cancer of the stomach. Filling defects may be demonstrated by skiagraphy. The main importance of the condition is that it can be controlled by **X-ray Treatment**. A number of lasting cures are on record. It is therefore well worth while to explore doubtful lumps in the abdomen and to confirm the diagnosis by microscopic examination, so that the suitable case for radiotherapy may be recognized. To radiate patients without a diagnosis runs too great a risk of useless fierce reactions.

Gastrostomy.—Probably most surgeons use the Witzel or the lobster-pot technique, but these have the drawback that if the rubber tube is left out for any length of time the track may close. Various methods have been introduced that provide a tube of stomach wall lined by mucosa. One such was described in the *MEDICAL ANNUAL* for 1929 (p. 449). The author, H. E. Martin, with W. E. Watson,⁴ now abandons that procedure and returns to the original Janeway gastrostomy, which is done through a two-inch incision in the middle of the left rectus, a rectangular flap of stomach wall being turned down, hinged on the greater curvature (*Plate XLVIII*). This is converted into a tube and brought out through the incision. Of 52 cases, only 5.8 per cent died. A mucosa-lined tube may be constructed in another way, by the Jianu gastrostomy technique, which is sufficiently explained by *Plate XLIX*. The tube may be 8 in. long. It is left unopened externally for a day or two, to avoid infection of the track. It must be pulled up taut, or a curved track may be formed which a catheter cannot enter. G. T. Pack,⁵ of New York, prefers the Jianu to the Janeway gastrostomy.

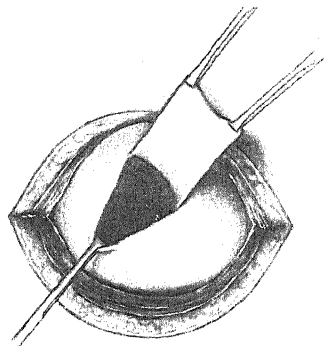
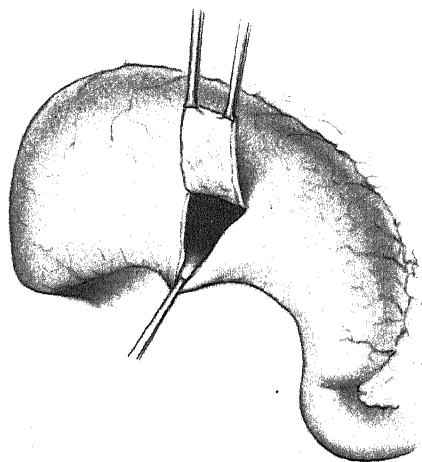
Gastrectomy.—Even those who do not read German, but wish to see how a master of surgical handicraft, Professor Eiselsberg, of Vienna, performs a gastrectomy, may learn all about it from the nineteen excellent pictures in R. Demel's article.⁶

R. Friedrich and H. Weber⁷ point out that in cancer cases the stomach contains numerous bacteria such as are normal in the colon; in duodenal ulcer

PLATE XLVIII

THE JANEWAY GASTROSTOMY

(H. E. MARTIN AND W. R. WATSON)



The flap has been raised and the Allis clamp at the lesser curvature marks the point of beginning closure.

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PLATE XLIX
THE JIANU GASTROSTOMY
(G. T. PACK)

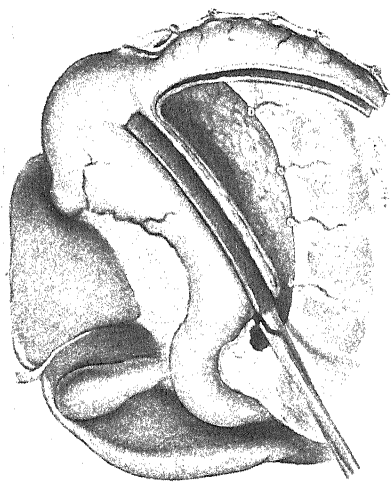


Fig. A

Fig. A.—Second step. Semidiagrammatic sketch to show the construction of the gastrostomy tube. An inner Connell suture and outer continuous Lambert suture close the stomach and the tube.

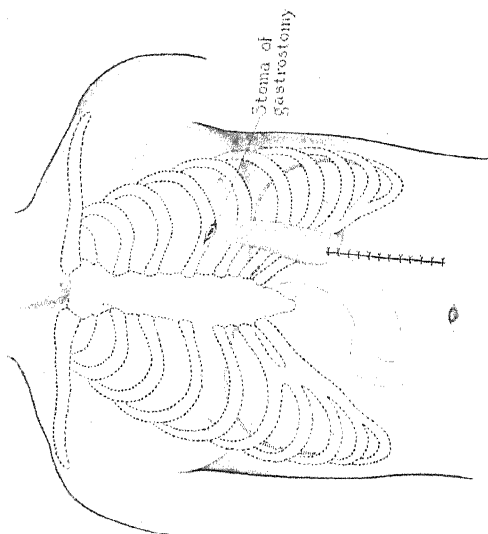


Fig. B

Fig. B.—Fourth step. Location of incision for permanent gastrostomy in order to secure valve-like control against leakage by pressure against continuous Lambert. If anastomosis to esophageal stump is planned, the incision should be mid-epigastrium, as the stoma then can be placed much higher. Abdominal wound completely closed. The tube emerges through muscle and fascia, then is drawn subcutaneously to the incision on chest selected for the stoma.

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the stomach is practically sterile. Peritonitis is the cause of death in 70 per cent of fatal cases after gastrectomy and 30 per cent after gastro-jejunostomy. In ulcer cases it is comparatively uncommon.

REFERENCES.—¹*Zentralb. f. Chir.* 1933, March, 734; ²*Ann. of Surg.* 1932, Aug., 240; ³*Ibid.* Nov., 911; ⁴*Surg. Gynecol. and Obst.* 1933, Jan., 72; ⁵*Ibid.* July, 86; ⁶*Arch. f. klin. Chir.* 1932, Oct., 1; ⁷*Ibid.* Sept., 673.

STOMACH, ULCER OF. (See GASTRIC AND DUODENAL ULCER.)

STREPTOCOCCAL PERITONITIS. (See PERITONITIS, PNEUMOCOCCAL AND STREPTOCOCCAL.)

STREPTOCOCCUS INFECTIONS. J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—R. E. Archibald and R. F. Femster¹ record an epidemic of 20 cases of septic sore throat which was definitely traced to milk from a single cow. The attack rate was high, as 87 per cent of the persons who drank the milk became ill. There were 3 deaths—a fatality rate of 15 per cent. Hæmolytic streptococci were found in cultures taken from the throats of 15 persons and from the throat of the milker, and in milk from the diseased quarter of the cow's udder.

SYMPTOMS AND COMPLICATIONS.—I. Pilot and P. Rosenbaum² made a bacteriological examination of 102 children with sore throat and found *Str. epidemicus* in 9 and ordinary hæmolytic streptococci in 50 others. The sore throat due to *Str. epidemicus* was sporadic and not related to the supply of milk. The symptoms connected with the sore throat due to *Str. epidemicus* were similar at the onset to those of patients with ordinary sore throat, but complications and sequelæ such as adenitis, otitis, and nephritis were commoner in the former. The writers suggest that the greater frequency of complications may be due to the capsule and the mucoid character of *Str. epidemicus*, properties that have been associated with added virulence and aggressiveness.

Since the publication of Appelbaum's paper (see MEDICAL ANNUAL, 1933, p. 450) four more cases of recovery from streptococcal meningitis have been recorded by E. Lewis,³ M. S. Ersner and T. H. Mendell,⁴ and H. Rockett⁵ respectively. Lewis's patient was a boy, aged 8 years, who developed otogenic meningitis. Recovery followed repeated lumbar punctures, transfusion of citrated blood, and removal of the focus of infection by mastoidectomy. Ersner and Mendell's cases occurred in a man aged 21 and a woman aged 19, in whom streptococcal meningitis was also secondary to otitis media. Mastoidectomy was performed in both cases, and blood transfusions, frequent lumbar punctures, and intrathecal injections of **Antistreptococcal Serum** were used as adjuncts to the principal treatment, which consisted in intracarotid injection of **Acriflavine** and **Pregl's Solution of Iodine** twice daily. In both cases **Cerebral Dehydration** by restriction of fluid intake and intravenous injection of **Dextrose** lessened the symptoms of increased intracranial pressure and so proved of great value. Rockett's case was exceptional in that otitis media was not present at any stage. The patient was a boy, aged 2½ years, suffering from whooping-cough complicated by bronchopneumonia, who developed nuchal rigidity. On lumbar puncture turbid fluid under increased pressure escaped, and a pure culture of hæmolytic streptococci was grown therefrom. Recovery followed intrathecal and intramuscular injection of **Anti-scarlatinal Serum**.

REFERENCES.—¹*New Eng. Jour. Med.* 1932, cccvi, 1252; ²*Amer. Jour. Dis. Child.* 1932, xlv, 994; ³*Arch. of Pediat.* 1932, Sept., 632; ⁴*Jour. Amer. Med. Assoc.* 1932, xcix, 1596; ⁵*Brit. Jour. Child. Dis.* 1933, xxx, 196.

SUBACUTE COMBINED DEGENERATION OF THE SPINAL CORD. (*See also* ANÆMIA, PERNICIOUS.)

Macdonald Critchley, M.D., F.R.C.P.

TREATMENT.—It has been the experience of most physicians that the usual treatment of a patient with combined degeneration of the cord produces disappointing neurological results, though the beneficial effect upon the anæmia may be marked. On the other hand, a few observers have claimed that **Liver Therapy** can produce a most striking amelioration in the spinal signs and symptoms. In a recent review of the treatment of subacute combined degeneration of the cord, T. K. MacLachlan¹ emphasizes the importance of pushing the liver medication to a greater degree than is usual in the management of the complicated cases of anæmia. Moreover, at the onset it should also be given in the form of one of the intramuscular preparations as well as by mouth. The proprietary preparations **Campolon*** and **Hepatex†** are available, and at the onset the equivalent of 500 grm. daily should be given. Both fresh liver and liver extract should be administered orally so as to total an equivalent of 1 lb. daily. Raw liver is more efficacious than cooked. The aim of treatment is to produce an erythrocyte count of five million; until then no reduction in liver therapy is advisable. The use of preparations of fish liver is suggestive, and, if proved to be efficacious, will have the great advantage of cheapness. Extracts of **Hog's Stomach** may be employed instead of liver, but here again larger doses are required. MacLachlan advises 30 to 40 grm. daily. The use of **Brain Substance** in the treatment of subacute combined degeneration necessitates smaller doses, however, than in the treatment of the anæmia (Ungley). Brain should be taken raw, in the form of a purée flavoured with tomato or orange juice, the dosage being 480 grm. daily.

Recently W. Sargent^{2,3} has employed massive doses of **Iron**, instead of liver, in the treatment of the nervous complications of pernicious anæmia. Bland's pill should be given in doses of 150 gr. daily for two to three months, after which time a maintenance dosage of 30 to 40 gr. daily may be adopted. Treatment with vitamin preparations is fashionable at present, and in experimental cases Mellanby was able to improve the neurological complications by the use of **Carotene**. Preparations of B₁ and B₂, as contained in **Yeast** or in **Marmite**, have been recommended by Strauss and Castle. The use of intramuscular injections of concentrated **Gastric Juice** (300 to 500 c.c. of gastric juice) has been proved by Morris to be of value in the treatment of Addisonian anæmia, but reports as to its effect in subacute degeneration of the cord are yet to come. General measures are important in the management of the patient, and urinary antiseptics or lavage of the bladder may be required. Bedsores must be sedulously avoided; focal sepsis should be eradicated and constipation controlled. **Thyroid Extract** is at times of value in the improvement of the general state. Gastric disorders are best treated with dilute **Hydrochloric Acid**, in doses of 1 to 2 drachms.

REFERENCES.—¹*Med. Press and Circ.* 1933, July 26 (Suppl.), p. xv; ²*Lancet*, 1932, Dec. 17, 1322; ³*Brit. Med. Jour.* 1933, June 24, 1100.

SUBPHRENIC ABSCESS.

A. Rendle Short, M.D., F.R.C.S.

C. W. Flynn,¹ of Dallas, Texas, issued a questionnaire to surgeons, of whom sixty-one gave their experience of 346 cases, 333 having been operated upon. The results showed a general mortality of 37.9 per cent. The great majority have been approached across the pleura or the peritoneum. Of 38 cases

* Bayer Products Ltd., Africa House, Kingway, London, W.C.2.

† Evans Sons Lescher & Webb Ltd., 56, Hanover Street, Liverpool.

PLATE I—SUBPHRENIC ABSCESS
(C. W. PLANN)

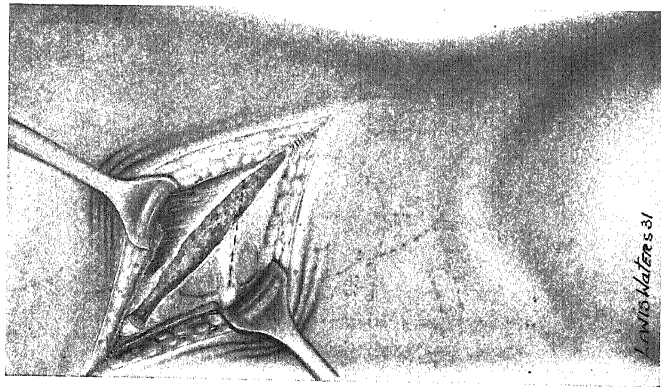


Fig. A.—Showing bed of twelfth rib, after incision has been made and abscess exposed. Dashed line shows location of deep transverse incision at level of first lumbar splanchnic process which is to extend down to renal fascia.

MEDICAL ANNUAL, 1934

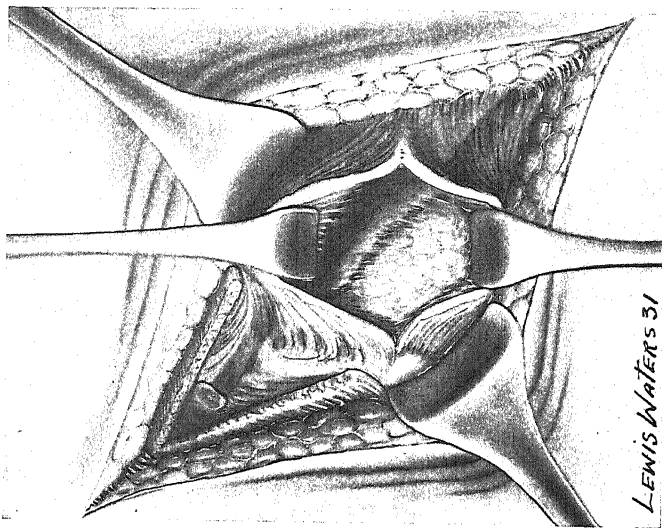
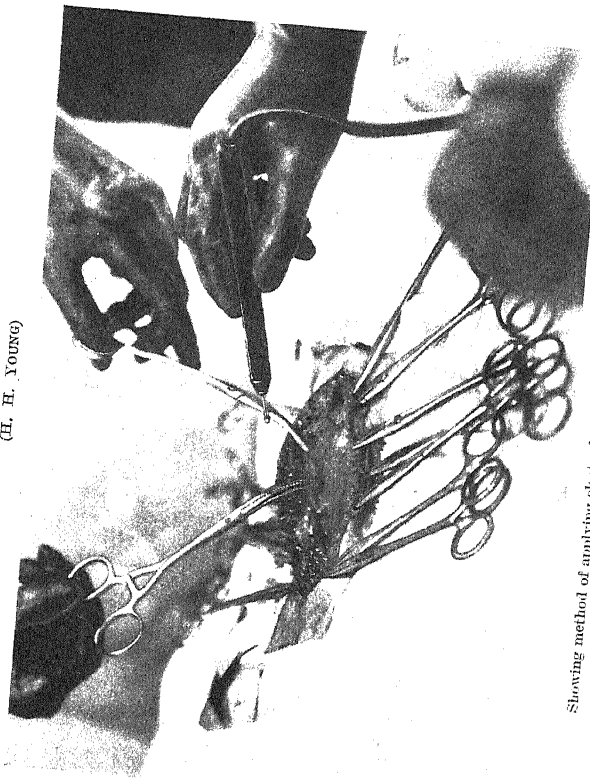


Fig. B.—Exposure of under surface of diaphragm and beginning of its separation from peritoneum.

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PLATE LI
ELECTROHÆMOSTASIS
(H. H. YOUNG)



Showing method of applying electrode momentarily to arrest bleeding point.

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drained extraperitoneally only 18.4 per cent died, and the author speaks in favour of this whenever possible. It can be done under local anaesthesia. The twelfth rib is resected, and a transverse incision made through the attachment of the diaphragm below the bed of the resected twelfth rib at the level of the first lumbar spinous process. The renal fascia and fat are displayed, and the peritoneum stripped away from the diaphragm (*Plate L*). The pus is now located with a needle, if below the liver; if not, the suprahepatic region is explored. E. Trevani² gives the twenty-five year experience of the Vienna University Clinic. There were 64 cases, with a mortality of 29.7 per cent. In 38 cases the abscess was drained by rib resection; 11 died. The commonest cause was appendicitis, next came gastric or duodenal ulcer, then liver and gall-bladder diseases.

REFERENCES.—¹*Amer. Jour. Surg.* 1932, Aug., 183; ²*Deut. Zeits. f. Chir.* 1932, Nov., 751.

SURGICAL OPERATIONS IN SENILITY.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The success following prostatectomy in old men and the safety with which prolonged anaesthesia is borne in manipulation of fracture of the neck of the femur have shown surgeons that operations are well borne in old age. Pólya¹ reports 27 cases who were operated upon between the ages of 71 and 88 years and were cured. The operations include incarcerated umbilical hernia, bilateral incarcerated femoral hernia, splenectomy, bowel resection, acute intestinal obstruction, suppurative cholecystitis, and diabetic gangrene. All the conditions mentioned in Pólya's paper were of a major kind. The extensive development of local anaesthesia, the increased understanding of a sepsis, and our knowledge of after-treatment make the senile patient a much better risk than he was twenty years ago. Nevertheless, old persons develop pneumonia much more readily than the young, and their resistance is much less. In the absence of special contra-indication to surgical intervention, such as cardiac or renal insufficiency, an operable carcinoma should be removed even in the case of a patient who is very old.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1932, Nov., 464.

SURGICAL TECHNIQUE.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Treatment of Growths by Electrosurgery.—G. A. Wyeth¹ states that the ideal treatment of growths has not yet been realized. He believes that cancer is a disease of disturbed anterior pituitary secretion. A fragment of a tumour can be obtained for microscopical examination in frozen section by the cutting current. He urges electrosurgery instead of scalpel surgery. The former has the advantage of sealed lymphatics and sterilized tissues.

Electro-coagulation in Cases of Melanoma.—P. D. Amadon² states that a malignant melanoma has its origin as a rule from the naevus cells of pigmented warts and moles. He condemns the use of electro-coagulation in these cases and comes to the following conclusions:—

1. The cases of malignant melanoma in a series of 27 cases treated with the electric needle showed a 100 per cent recurrence.
2. Electrocoagulation of a group of senile keratotic lesions demonstrated the escape of 'tissue gas' into the peripheral visible venules under pressure.
3. An application of this discovery to electrocoagulation of malignant melanoma renders plausible the explanation of high recurrence on the basis of the mechanical forcing of unstable malignant cells more widely into the tissues by pressure exerted in the lymphatics and vessels by generated 'tissue gas'.

4. Preliminary encircling of the primary growth with the electric needle through apparently healthy tissue is unsound as the fascial lymphatics wide of the primary lesion may be filled with tumour cells, the same phenomenon of generated 'tissue gas' pressure occurring here with similar results.

5. Inefficient treatment of benign skin lesions, especially the benign melanoma with the electric needle, may initiate malignant change by acting as an irritant or by the implantation of potential chromatophores into the subcutaneous tissue.

6. Surgical excision of these lesions, with special reference to the anatomy and mode of metastasis, remains the procedure of choice.

Electrohæmostasis in Place of Ligatures.—For some years many surgeons, more particularly those specializing in the surgery of the brain, have found the high-frequency electrical current rapid and useful for the sealing of small blood-vessels.

Hugh H. Young³ is impressed with the value of electrosurgery in arresting hæmorrhage. In extensive operations which would ordinarily require great numbers of ligatures the value of electrosurgery is great if the technique is such as to leave a minimum amount of destructive tissue change. Ligatures themselves are recognized as distinct impediments to perfect wound healing.

Young has assisted in designing a special high-frequency apparatus or coagulator. The manner in which the electrode is used is shown in *Plate LI*. A mere touch of the hæmostatic forceps with the electrode will instantly seal any small blood-vessel.

Sterilization of Catgut Sutures.—R. O. Clock⁴ deals with this subject. He records the disturbing information that none of twenty-seven chemical compounds studied was found to have reliable or uniform action in the sterilization of catgut. On the other hand, catgut subjected to heat sterilization showed an entire absence of bacterial growth. The so-called chemical sterilization of surgical catgut by any method yet devised is inefficient and unreliable. Carefully controlled heat sterilization is the only uniformly reliable and positive method. Clock's experimental work is of primary importance, for it not only proves the inefficiency of chemical sterilization but also demonstrates the deleterious effect that such chemicals have upon the tissues when the catgut is introduced. On the other hand, heat sterilization is effective and reliable. After heat sterilization there is no impairment of tensile strength, thus showing that with sufficient care this method can be employed without altering the physical properties of the catgut. The exact process of heat sterilization employed is not described.

Securing the Patient's Hands during Operation.—Attention is directed to this minor matter by W. Bartlett, jun.⁵ The usual method of confining the hands is to place them under the buttocks of the patient. This is a quick and effective procedure, but the reviewer knows of one case where the skin sloughed on the back of the hand, exposing the extensor tendons. Bartlett writes as follows on this subject:—

"For the past year and a half I have followed the plan illustrated in the accompanying sketches (*Figs. 87, 88*). Two points contribute to its complete success: (1) The noose around the wrist grows snugger if the patient struggles; (2) The arm is maintained in extension, preventing flexion at the elbow with pronation of the forearm which offers an entering wedge for the hand against any cuff of fixed diameter and shape. The method in detail follows:—

"The wrist is snugly encircled by a folded surgical towel which extends downward as far as the level of the thenar and hypthenar eminences. The wrist is then encircled by a doubled muslin bandage and the ends are pulled through the looped end, making a slip noose which is drawn up snugly just above

the level of the styloid processes of the radius and ulna; the point on the noose at which the ends pass through the loop should be opposite the styloid process of the radius. The arm is then laid on the operating table at the patient's side in complete extension, and the ends of the noose are passed around the leg of the table and tied securely, keeping moderate tension on the arm. A thin dressing pad is placed under the elbow. The folded towel under the noose prevents more than a slight degree of interference with superficial venous

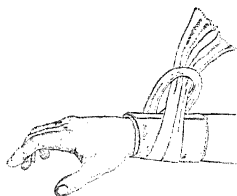


Fig. 87.—A loop of heavy muslin bandage encircles the wrist, which is protected by a folded towel.

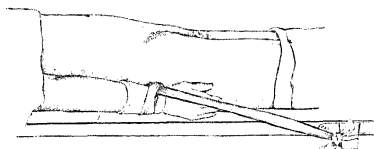


Fig. 88.—The bandage is attached to a convenient portion of the operating table, not far from the level of the patient's knees.

(Figs. 87, 88 by kind permission of the 'Journal of the American Medical Association'.)

return from the hand; and interference with the arterial flow, deep venous return, or nerves at the wrist is impossible with this method. A patient in the Trendelenburg position, if conscious as in spinal analgesia, will occasionally have so much discomfort from the added countertraction on the wrists after the head of the table is dropped that the extension will have to be slackened a little. I have not seen a single hand escape from this confinement since I started using it."

Surgical Uses of Rubber from Motor Tyre Inner Tube (see also ANÆSTHESIA).—R. J. McNeill Love⁶ points out that a piece of rubber cut from the inner tube of a tyre acts as an excellent dam to prevent extrusion of the

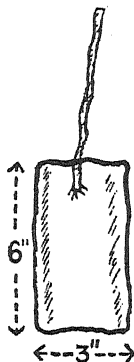


Fig. 89.—Rubber dam with tape attached.

(Figs. 89-91 by kind permission of the 'Clinical Journal'.)

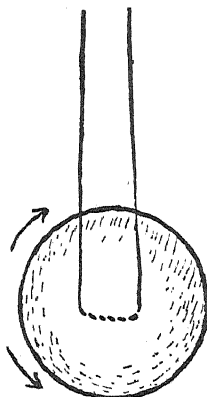


Fig. 90.—Disc of rubber transfixed by suture. The arrows indicate the direction in which the disc is rolled so as to form a scroll.

intestines, etc., during a difficult closure of an abdominal wound (Fig. 89). He also has made use of portions of this thick rubber to underlie mattress tension stitches in the abdominal wall.

The most interesting practical application of such a portion of rubber is in the treatment of faecal fistulae (*Figs. 90, 91*). A disc of inner tube is cut to the size of a halfpenny in the case of small gut or a penny or larger if the fistula is of the caecum or colon. The disc is transfixied by a silkworm suture which is introduced near the centre and made to return through the rubber, in the manner of a mattress stitch, at an interval of about $\frac{1}{2}$ in. (*Fig. 90*). The disc is now rolled tightly between the finger and thumb, so that the silkworm suture is in the centre of the resultant scroll, from which the ends of the suture protrude. The scroll is grasped with sinus forceps and inserted along the fistula. With a little manipulation the scroll is introduced into the lumen, and on withdrawing the sinus forceps the elasticity of the rubber causes the scroll to open. Traction of the silkworm suture approximates the disc to the wall of the bowel and so prevents faecal contents from escaping along the fistula. The

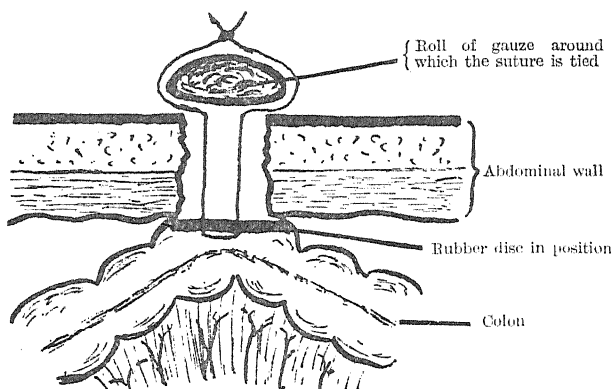


Fig. 91.—Use of rubber dam in faecal fistula.

free ends of the suture are tied round a small roll of gauze, and thus the disc is fixed in position (*Fig. 91*). When healing of the fistula is practically complete one end of the suture is cut, so that the remainder can be withdrawn, and the disc, thus set free passes uneventfully along the bowel and is subsequently evacuated. The author has used this method with gratifying results, and on one occasion a fistula of four and a half months' duration, which showed no sign of healing and was surrounded by excoriated skin, healed within three weeks.

Blood Transfusion.—*See special article, p. 82.*

REFERENCES.—¹*New Eng. Jour. Med.* 1932, Sept. 8, 450; ²*Surg. Gynecol. and Obst.* 1933, May, 943; ³*Ibid.* 1932, July, 100; ⁴*Ibid.* 1933, Feb., 149; ⁵*Jour. Amer. Med. Assoc.* 1933, May 13, 1490; ⁶*Clinical Jour.* 1933, June, 244.

SYCOSIS BARBÆ. (*See SKIN, PYOGENIC INFECTIONS OF.*)

SYMPATHETIC NERVOUS SYSTEM, SURGERY OF. (*See also* KIDNEY, SURGERY OF—RENAL SYMPATHECTOMY; THROMBO-ANGITIS OBLITERANS.) *Geoffrey Jefferson, M.S., F.R.C.S.*

The Presacral Nerve.—The great success claimed by Continental surgeons, notably Cotte, for division of the pelvic sympathetic nerves in various forms of pelvic disease has gradually attracted attention in English-speaking countries. The operation as originally proposed was designed to relieve or, even better, to cure the pain of malignant disease of the uterus and, more recently,

of the bladder. Having achieved some success in these fields it was extended to relieve maladies of non-malignant origin such as intractable dysmenorrhœa. It is being employed on an increasing scale in this latter condition, but at the moment it is not possible to assert its precise utility. The contention that pain can be cured by division of the presacral nerve raises a number of interesting points which are important, for until they are settled the wise doctor cannot tell exactly which patient to advise to undergo the operation. A certain number of clinicians, notably O. Foerster, have long maintained that pain may pass along sympathetic pathways to the spinal cord, and, entering the posterior roots, follow the spinothalamic tracts to the brain. The more orthodox hold that not more than two observations have ever been made which give support to such a view, and believe that this is not enough to warrant firm conclusions. It may be the case that the relief of pain effected by division of sympathetic fibres, such as those which form the presacral nerve, is due to a vasodilatation like that which brings such comfort to sufferers from Raynaud's disease. The presence of efferent (motor or motor inhibitory) fibres in the sympathetic nervous system has never been called in question, and the rationale of removing the sympathetic ganglia to suppress over-activity resulting in vasospasm on the one hand, or to suppress undue inhibition as in Hirschsprung's disease on the other, is well understood. Within the pelvis the sympathetic inhibitory action on the bladder expulsive (detrusor) musculature can be put out of action by section of the presacral nerve, a section which at the same time causes a lowering of tone in the smooth sphincter at the bladder neck without producing incontinence. Presacral neurectomy should therefore make it easier for the bladder to empty. This conception and its application to man we owe, of course, to J. R. Learmonth,¹ but it has been tested out by a few other surgeons whose reports are of importance.

F. H. Colby² records two cases from the Massachusetts General Hospital. One, a boy 16 years of age with a spina bifida which had been operated upon fifteen years before, had deformities of the feet, and anæsthesia in the distribution S.1-4. During the last two years the bladder had become infected, and residual urine was present (5 oz.). Catheter drainage did not improve the residual urine and a presacral neurectomy was performed; five months later no residual urine was present and the patient greatly improved. The second case was one of bladder infection and chronic retention in a tabetic subject, but here the operation did no good. Hamilton Bailey³ reports a very successful case, a young woman with a post-partum urinary retention with cystitis of nine months' standing. In this case residual urine measured 20 oz. After operation this improved to such a degree that there was eventually only 1 oz. of residuum. Gordon Foulds,⁴ of Toronto, obtained decrease of residual urine from 28 oz. to 2 oz. four months after operation in a young man after a spinal injury.

Study of the details of these cases shows that the result is not immediately obtained, and that although there is an immediate small improvement some weeks must pass before the maximum effect is obtained. It might be that this points to improvement due chiefly to skilled care in hospital, but this cannot be the whole explanation, for all the cases had considerable periods of catheter drainage and lavage beforehand without showing any appreciable alteration. In Bailey's case, for instance, in spite of electrical treatment, strychnine, and so forth, there was rarely less than 20 oz. of residual urine before neurectomy. The patient emptied the bladder completely the day after operation in this case. In the others emptying came more slowly, due in all probability to the fact that they had more damage to the bladder nerves

which effect contraction of the vesical musculature. In Bailey's case no pathology is suggested as a cause of the condition, and it is likely that such nerve damage as there was was slight.

The anatomy of the presacral nerve has been studied in two important papers, one by A. A. Davis,⁵ the other by L. Elaut.⁶ Davis gives a good description of neurectomy and advises removal of all the fibrocellular tissue lying in the triangle within the three points of Cotte: (1) The sacral promontory; (2) The bifurcation of the aorta; (3) The inferior mesenteric artery (*Plate LII*). No attempt should be made to follow the nerve fibres below the sacral promontory, for very troublesome bleeding may then be induced from the middle sacral artery. The left ureter may run close to the middle line and an accessory ureter be mistaken for the presacral nerve. The 'nerve' is rarely a recognizable thick bundle but is usually made up of a number of fine fibres running vertically downwards beneath the peritoneum rather to the left of the mid-line. Only in very thin subjects can they be seen through the peritoneum. The operation is simple and no untoward results follow in the female. In the male it must be remembered that ejaculation ceases after the operation owing to paralysis of the vesicles, and so the patients are thenceforth sterile, but not impotent.

(See also BLADDER, SURGERY OF—POST-OPERATIVE RETENTION.)

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1932, xcvi, 632; *Zeits. f. urol. Chir.* 1933, xxxvi, 195; ²*New Eng. Jour. Med.* 1932, Aug., 302; ³*Practitioner*, 1933, April, 505; ⁴*Brit. Jour. Surg.* 1932, July, 1932; ⁵*Ibid.* 1933, Jan., 516; ⁶*Surg. Gynecol. and Obst.* 1932, Nov., 581.

SYPHILIS.

Col. L. W. Harrison, D.S.O.

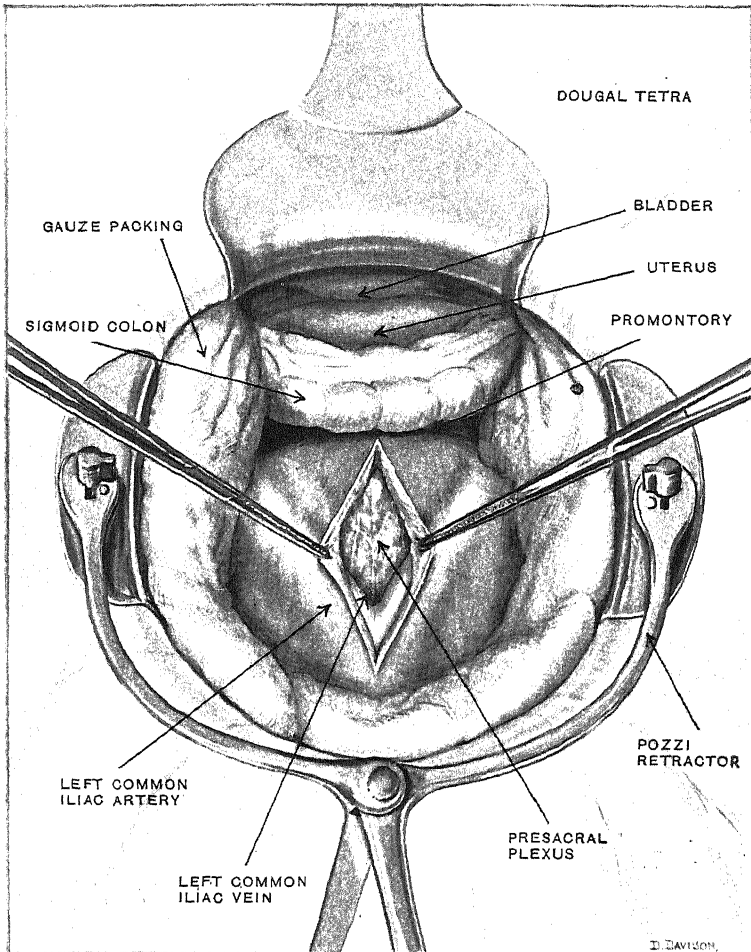
INCIDENCE.—T. Grüneberg¹ is not inclined to agree with the views of Venzmer and others that syphilis is a disease that is dying out. He thinks that the present decline may be merely an epidemiological depression such as occurs in other infectious diseases. Apart from this, syphilis is tending to become less manifest externally, and chancreless syphilis has been shown to be far more common than has generally been thought, so that much syphilis may be going undetected. He concludes that we shall be able to speak of it as a disease that is dying out when we see a definite decline in its late manifestations. The idea that syphilis must die out because of the rapidly sterilizing effect of arsenobenzene compounds depends for its fulfilment on earliest possible treatment and persistence under treatment, but experience shows that a high proportion of patients do not fulfil these conditions.

[As an antidote to these pessimistic views it may be contended that syphilis is less manifest externally now not because of a change in its nature, but because of the effect of treatment. An analysis of the symptoms presented by patients on first attendance at a Continental clinic a few years ago showed that at this visit the external signs are found to be just as severe now as they were in pre-salvarsan days, but they disappear much more quickly, so that at any one time a clinic cannot show as formerly a large number of cases presenting well-marked signs of the disease. Chancreless infection may be commoner than is generally thought, but there is no evidence that it is commoner now than it was formerly; most of the evidence that chancreless infection is not uncommon is based on cases with tertiary lesions (i.e., infected many years ago) but with no history whatever of a chancre. As for the notion that persistence in treatment is a condition of sterilization, it has to be remembered that a comparatively small amount of treatment seems to have sufficed in a large number of cases that have now been observed; the long programme of treatment which is usually prescribed is designed to assure as nearly as possible cent per cent permanent cures.—L. W. H.]

PLATE LII

RESECTION OF THE PRESACRAL NERVE
(COTTE'S OPERATION)

(A. A. DAVIS)



The operative field.

*By kind permission of the
'British Journal of Surgery'*

Life Cycle of *Spirochæta Pallida*.—F. Jahnelt, R. Prigge, and M. Rothermundt² refer to the views which have been expressed by various workers, notably Levaditi and colleagues, that *S. pallida* represents only one phase of the life cycle of the organism of syphilis. These views rest mainly on the rarity with which *S. pallida* is found microscopically in the glands and organs in experimental syphilis, though transplants show these tissues to be infectious; also on the granule and other forms seen in sections of syphilitic tissues by various histologists. The authors say that the suggestion that an ultra-microscopic stage exists is controverted by the fact that the organism of syphilis is not a filter-passer. A much more likely explanation of the rarity with which *S. pallida* is seen in glands is that, like *S. recurrens*, it multiplies and diminishes in numbers in cycles, and that, when it is not seen, the number per unit volume of material has become reduced below the figure at which they can be found in sections. In order to show that a minimum number of spirochætes per unit volume must be present for them to be found by microscopical methods, the authors first estimated the number of *S. obermeieri* and of *S. hispanica* per c.mm. in samples of infected mouse blood and then diluted the samples progressively with sodium citrate solution. When the dilution had reduced the number per c.mm. to 300 to 400 the closest search under dark-ground illumination failed to discover one. At the same time intraperitoneal inoculation of fresh mice with 0.4 c.c. (the quantity commonly employed in such inoculations) of this dilution resulted in the animals becoming infected; in fact, 0.2 c.c. of an emulsion containing only 156 spirochætes per c.mm. was successful. The authors point out that the conditions of the microscopical search were far easier than in the case when tissue is being examined; hence the fallacy of arguing that because *S. pallida* cannot be seen in a tissue which inoculation experiments prove to be infectious the organism of syphilis must be there in some other form. Again, if one searches the brains of paralytics one often finds *S. pallida* only in very small numbers or not at all; yet in these one does not see the forms described by Levaditi and colleagues as stages in the life cycle of *S. pallida*.

TREATMENT.—F. Lesser,³ in a paper in which he questions the necessity of long persistence in treatment, states his belief that in early cases of syphilis, even those with a secondary roseola, it is justifiable to suspend treatment after the first course if then the serum reactions remain or have become negative. Out of 178 such cases that received no more than this amount of treatment, 162 remained free from relapse during a period of not less than two years (70 for three or more years). The 16 relapses occurred within a year of treatment being suspended, 9 within the first three months. Consequently he thinks it justifiable to reckon patients as successfully treated who have remained free from relapse for one year after suspension, and out of 218 so observed, found only 16 (7.2 per cent) relapses. This relapse rate was approximately the same as that (7.3) in 76 patients who completed a second course after being negative at the end of the first, so that the author does not think much was gained by this second course. A table of 28 reinfections from one and a quarter to thirty years after the original infection, and including a number who had received only one course, is shown as further evidence that syphilis can be cured with comparatively little treatment. The programme recommended by the author is a series of injections of '914' (0.45 to 0.60 grm.) until the serum reactions are negative, and then three further doses to make sure. After this the patient is examined and tested at least every two months for the first six months and subsequently every three months for the remainder of the two years. He holds

that only cases which resist the first course, or relapse after it, need be treated on the chronic intermittent plan.

H. T. Schreus and F. Bernstein,⁴ as a result of seven year's experience, recommend a treatment of syphilis which is based on the principle of maintaining the concentration of the **Arsenobenzene** preparation in the body longer than obtains in the ordinary method of dosage. This is done without raising the individual dosage on the following plan:—

DAY OF TREATMENT	BISMOGENOL OR MESUROL	NEOSALVARSAN	PYRIFER
	c.c.	gm.	Strength
1st	0.5	—	—
2nd	—	0.45	—
5th	1.0	0.60	—
8th	—	—	I
9th	1.0	0.45, 0.15, 0.15	—
12th	1.0	—	II
15th	—	—	III
16th	1.0	0.45, 0.3, 0.3	—
19th	1.0	—	IV
22nd	—	—	V
23rd	1.0	0.6, 0.45, 0.3*	—
26th	1.0	—	VI
29th	—	—	VII
30th	1.0	0.6, 0.45, 0.45*	—
33rd	1.0	—	VII
36th	—	—	VII
37th	1.0	0.6, 0.45, 0.45*	—
40th	1.0	—	VII
44th	—	0.6, 0.45, 0.45*	—

* In women as a rule the dosage was not increased beyond that given on the sixteenth day. The multiple injections of neosalvarsan on any one day succeeded one another at intervals of about twenty minutes, by which time the concentration of the remedy in the body has sunk to about one-half of that immediately after injection.

The treatment has mostly been restricted to in-patients, and intolerant patients are eliminated by the preliminary two doses, given on the first and fifth days. Prior to using **Pyriferr*** the authors employed malaria as the pyrogenic adjuvant. Toxic effects are stated to be no more frequent under this form of treatment than the ordinary. The treatment was well tolerated even by cases with syphilitic disease of the heart and great vessels, as well as by those with severe changes in the spinal fluid. Judged by the usual criteria, the results appear from the authors' tables to have been excellent. Only one course is considered necessary in sero-negative primary syphilis, and two in cases which have become positive, the second after an interval of six weeks to six months.

E. E. Prebble⁵ reports on the results of an intensive course of treatment which was planned for merchant seamen attending the Seamen's Dispensary, Liverpool, with the idea of reducing to a minimum the duration of the patient's stay ashore and yet permitting him afterwards to go to sea for three months without treatment between the first and second courses "with the certainty, as will be shown later, that he will not have a clinical or Wassermann relapse during that time". The author mentions that if the man's circumstances compel an absence of four and a half months, this period is allowed to elapse between the first and second courses. [The Brussels Agreement provides for

*Chas. Yarrow & Co., 36, Basinghall Street, London, E.C.2.

a seaman of any nationality receiving treatment free of charge at a V.D. Treatment Centre, so that a merchant seaman, after a short period of treatment ashore at the outset, may continue his treatment at the different ports visited by his vessel. The authors of the course under review, however, have evidently designed their treatment of syphilis with the idea of making their patients independent of the provisions under the Brussels Agreement.—L. W. H.]

The course as first outlined consisted of two doses of '914' (0.45 and 0.6 gm.) a week until the 25th day (eight doses) and then two of 0.75 gm. at intervals of a week, making a total of 5.7 gm. '914' in 39 days. Concurrently with this, twelve injections of a preparation of **Bismuth** were given in such doses as contained 0.3 gm. metallic bismuth in the 39 days. The author states that they have used many preparations of bismuth, but have seen no material difference between them in respect of therapeutic efficacy. The results in 92 sero-negative primary cases, 77 sero-positive primary, and 33 early secondary cases in which this course was administered with perfect regularity, were completely negative reactions in every case. In 24 sero-negative primary cases, 32 sero-positive primary, and 9 secondary which completed the course "but with some irregularity in attendance" there were 7, 21, and 4 respectively with positive reactions at the end of the course. The incidence of jaundice and dermatitis in patients undergoing this course was "slightly higher than those obtained by syphilologists making use of the once-weekly course of treatment", and for the past two years the dosage has been reduced. In the modified course the patient receives 0.3 and 0.45 gm. '914' per week for a total of twelve injections (4.5 gm.), and concurrently twelve injections of a preparation of bismuth in doses containing 0.2 gm. metallic bismuth. The results in 40 sero-negative primary cases, 19 sero-positive primary, and 10 secondary who received this course with perfect regularity, have been completely negative reactions in every one. The results in the 19 cases whose attendance was "slightly irregular" were very different, 8 of them (including two that were originally sero-negative) showing positive reactions at the end of the course. [So far as the results go they seem to show that when the patient's circumstances are such that he can be certain of attending regularly for treatment only for about six weeks such a course as the first of those outlined above will afford him a reasonable assurance that he will not lose ground for at any rate three, or perhaps even six, months—but about 1 in 30 of such patients are likely to develop either jaundice or some dermatosis. The risk of his developing some such complication appears to be reduced to less than half (1 in 63) if the second of the above courses is adopted, but the reader will note that the number of cases which completed this course was too small to justify one giving a patient undergoing it any very strong assurance on the question of liability to relapse in a few months. It will be noted also that the patient must receive the treatment with perfect regularity.—L. W. H.]

An important analysis of results of treatment undertaken by the directors of five of the foremost American syphilis clinics in collaboration with officers of the United States Public Health Service⁶ should be studied in the original by all who are interested in the treatment of syphilis; only a few of the outstanding deductions made by the authors from their analysis can be reproduced here. In the treatment of early syphilis by far the best results were seen in sero-negative primary cases, and the difference between sero-positive primary and secondary cases in respect of serum results was so small that the authors think a sero-positive primary case should, for practical purposes of treatment, be regarded as having reached the secondary stage. The analysis

brought out the great importance of regularity in treatment during the first three months. Continuous treatment during this time gave 83.5 per cent reversals of the serum reactions to negative, while under intermittent treatment the percentage was only 16.2. Cases in which the treatment had been prolonged for more than a year showed far better results than did those in which it was carried out for less than this time. In the section on latent syphilis the authors comment on the large number of cases with no history of external signs, indicating again the fact that chancreless infection is far commoner than is generally thought. The analysis brings out the value of perseverance in treatment in old-standing cases. Whereas in the absence of treatment a case of some years' standing is expected by the authors to become negative in 25 to 35 per cent of cases, prolonged treatment raises the percentage of reversals to 85. As an illustration of the value of using a heavy metal (Hg or Bi) in conjunction with an arsenical, the following remark resulting from the discovery of a high incidence of neuro-recurrence in one of the five clinics may be quoted: "It seems an inescapable conclusion that this omission of some heavy metal treatment during the first course of arsphenamine is a factor in the much higher incidence of early infectious relapse and neuro-recurrence at clinic B. In early syphilis, including early latency, treatment with a heavy metal should be started before the conclusion of the first arsphenamine course and should completely fill the interim between courses." It is interesting that in the late cases the results of treatment with only heavy metal appear to have been as good as in those treated also with arsenicals.

'*Arsenic-resistance*.'—In reports on the treatment of syphilis it is not uncommon to find the term 'arsenic-resistant' used to explain the failure of a patient to respond to antisymphilitic treatment, or to be told that such-and-such a line of treatment may result in patients becoming arsenic-resistant. It has repeatedly been shown by various workers that the term is used much too lightly and that when a patient does not respond to arsphenamine treatment it is much more likely that the fault is in his tissues, which do not convert the injected remedy to that derivative which destroys *S. pallida*. Thus E. Hoffmann and G. Armuzzi⁷ described a case of relapsing syphilis which was completely resistant to several injections of arsphenamine compounds until a Zittmann's sweating cure was introduced, after which the response to arsenical treatment became normal. Also F. W. Oelze,⁸ in a review of the literature on the subject, concluded that there was no justification for the term; he said that one should not speak of 'salvarsan-resistant spirochaetes' but of 'salvarsan-resistant patients'.

Recently Warrington Yorke, in a paper read before the Medical Society for the Study of Venereal Diseases,⁹ reviewed the whole question of drug-resistance, and in regard to the question of drug-resistance in spirochaetes said that "although there is some evidence that it is possible to produce drug-resistant strains of blood spirochaetes, and possibly even of *Spirocheta pallida*, it is a much more difficult matter than in the case of trypanosomes. The clinical evidence that drug-resistance plays any serious part in the therapy of syphilis is still very unsatisfactory."

Calomel Inunctions.—Opinions have differed as to the efficacy of **Calomel Ointment** inunctions, some saying that in this form mercury is absorbed as well as it is in the form of metallic mercury ointment, and others that the absorption of calomel ointment is indifferent. H. N. Cole, H. F. De Wolf, Nora E. Schreiber, T. Sollmann, and J. Van Cleve¹⁰ submitted six male patients to daily inunctions for a month with 4 grm. of 50 per cent mild mercurous chloride ointment. The urinary excretion of mercury by patients undergoing calomel inunction was found to be only equal to that seen under

daily inunctions with 4 gm. of 5 per cent mercurial ointment for a month or about one-eighth the amount excreted under daily inunctions with 50 per cent mercurial ointment. The explanation lies in the fact that, as found by Fürbinger and Neumann, when metallic mercury ointment is rubbed into the skin the mercury finds its way into the hair follicles as far as the bulb and into the sebaceous follicles, while, as shown by Neisser and Siebert, mercurous chloride is physically less pliable, and is found only in the openings of the follicles.

Vaccine Treatment.—L. Spitzer¹¹ has revived a method of treatment which he reported on twenty-seven years ago. At that time he injected patients with a sterilized emulsion of chancre tissue, and reported that of 19 cases of early syphilis so treated, 7 remained free from symptoms two years later. Stimulated by the work of R. Hilgermann¹² which resulted in a method of growing *S. pallida*, Spitzer has treated a number of patients with **Vaccines** made of cultural spirochaetes. The following example may serve to show the possibilities of the treatment. A patient infected twelve years previously, and thoroughly treated, now had sluggish left and almost fixed right pupil, and also almost absent knee-jerks; blood and spinal fluid were positive. In about six weeks he received five injections of mixed vaccine followed by one of 'autovaccine' (0.5 c.c.). Two days after the sixth injection he showed a typical maculo-papular secondary syphilide, and the serum from a mucous patch contained *S. pallida*. The rash had disappeared a fortnight later and at the same time both pupils and tendon-jerks reacted smartly. A month after this the cerebrospinal fluid was negative. As the vaccine contained no living *S. pallida*, the secondary rash twelve years after infection must have been due to mobilization of spirochaetes in the patient; the incident showed that one must be careful over the dosage of the 'auto-vaccine'. The author reports other cases of a type that is well known to be resistant to ordinary treatment in which the vaccine acted well. He mentions also that in all cases of tabes the effect on the lightning pains was good.

Toxic Effects of Anti-syphilitic Treatment.—G. Ensbruner¹³ discusses the danger that the intracutaneous injection method of testing may itself sensitize the skin. He admits the experiences of others in this respect, but states that the danger can be avoided by using a sufficiently high dilution of the compound. His technique is to inject into three sites, strictly intracutaneously, 0.01 to 0.02 c.c. of 1-100,000, 1-10,000, and 1-1000 respectively, the three different strengths giving a better idea of the patient's degree of allergy. A positive immediate reaction is manifested by an increase in the size of the wheal, and in marked cases by the outbreak of a broad urticarial eruption some minutes after the injection. A late reaction appears as an oedematous bright red infiltrate which increases for forty-eight hours. In none of 150 control cases was the skin sensitized by this method, which, on the other hand, gave positive results in arsphenamine-sensitive cases. The author does not consider the epicutaneous test as good as the intracutaneous, but uses it in addition, the strength of the solution with which the patch applied to the skin is soaked being 10 per cent. The tests are applied on any suspicion of arsphenamine allergy and when this has occurred. They are repeated after four to five days whether the first results were negative or positive. Patients may be positive to one type of compound but negative to another; in such a case this other is likely to be tolerated. If the results are or become negative, the salvarsan therapy may be cautiously resumed.

In collaboration with J. Wendtberger¹⁴ Ensbruner has found that the serum of a patient who is sensitive to one or more of the arsphenamine group of remedies gives a complement-fixation reaction with those remedies, and suggests

that the test might be used to detect sensitiveness. Apparently a serum may give a reaction with one type of compound, e.g., neosalvarsan, but not with another, e.g., solu-salvarsan, and the skin sensitivity test may accord with the serum reactions in this respect.

A. E. W. McLachlan¹⁵ reports on some cases of arsenical dermatitis and jaundice, and of bismuth dermatitis, treated by intravenous injections of **Calcium Thiosulphate**, the calcium in place of the hitherto more usual sodium salt having been suggested by J. F. Schamberg and M. H. Brown,¹⁶ who had reported on calcium thiosulphate as being particularly efficacious in arsenical dermatitis. The author found the preparation useful; the dose recommended by Schamberg and Brown is 5 c.c. of a 10 per cent solution daily for three days and then two or three times a week.

B. Appel¹⁷ reports well on the result of intravenous injection of **Sodium Dehydrocholate** in gastro-intestinal disturbance and in jaundice resulting from arsphenamine treatment. The initial dose was 5 c.c. of a 5 per cent solution and the subsequent ones 10 c.c., the first three or four being given daily and the subsequent ones approximately twice a week. He quotes both C. Continescu and A. Savulesco, who were able to administer particularly heavy doses of '914' without ill-effect by dissolving the remedy in 5 c.c. of 20 per cent dehydrocholate of soda. Reference is also made to Hans Abelsohn, who reported on seven cases of jaundice occurring during arsphenamine treatment, in which the arsenical injections were continued without ill-effect thanks to the precaution of dissolving the remedy in sodium dehydrocholate. This salt is an oxidation product of cholic acid; it has a marked cholagogic effect. [At the V.D. Department, St. Thomas's Hospital, it has been found that when a patient's urine shows urobilinogen, which is a common precursor of jaundice, this can usually be prevented by dissolving subsequent doses of '914' in sodium dehydrocholate.—L. W. H.]

REFERENCES.—¹*Deut. med. Woch.* 1933, lix, 317; ²*Dermatol. Zeits.* 1932, lxiv, 29; ³*Deut. med. Woch.* 1933, lix, 767; ⁴*Münch. med. Woch.* 1932, lxxix, 1987; ⁵*Brit. Jour. Ven. Dis.* 1933, April, 119; ⁶*United States Public Health Service, Ven. Dis. Information*, 1932, cxxxiii, 135, 165, 207, 253, 317, 351, 371, 389, 407; ⁷*Deut. med. Woch.* 1927, liii, 51; ⁸*Arb. a. d. Staatsinst. f. exp. Ther. u. d. Georg-Speyer-Hause zu Frankfurt-a-M.* 1928, No. 21, 120; ⁹*Brit. Jour. Ven. Dis.* 1933, April, 83; ¹⁰*Arch. Dermatol. and Syph.* 1933, xxvii, 1; ¹¹*Münch. med. Woch.* 1932, lxxix, 1990; ¹²*Deut. med. Woch.* 1931, xii, (ref. Spitzer); ¹³*Arch. f. Dermatol. u. Syph.* 1933, clxviii, 356; ¹⁴*Wien. klin. Woch.* 1933, xli, 333; ¹⁵*Brit. Med. Jour.* 1933, i, 916; ¹⁶*Proc. Eighth Internat. Congress Derm. and Syph.* Copenhagen, 1930, 487; ¹⁷*Arch. of Dermatol. and Syph.* 1933, March, 401.

SYPHILIS OF THE HEART AND ARTERIES.

A. G. Gibson, M.D., F.R.C.P.

H. T. Karsner¹ records a case in which syphilitic disease of the pulmonary artery was accompanied by complete obliteration of the left branch, which extended to the hilum of the lung. Viewed from the main trunk, this branch appeared as a small pit-like depression. The pulmonary orifice was 8 cm. in circumference, the leaflets were thin and transparent, but immediately beyond this the arterial wall was thickened, wrinkled, and of a slightly bluish tint. These changes, characteristic of syphilis, extended through the entire course of the pulmonary artery. The left lung, which weighed 640 grm., had a thickened pleura and extensive intercommunicating tuberculous cavities with caseous pneumonia in the upper lobe. There was a tuberculous cavity in the lower lobe and the rest showed passive hyperæmia. There was some mes-aortitis of the systemic aorta. The patient was a woman, aged 28, who early in February, 1930, had noticed dizziness, shortness of breath, and a sensation described as a pulling-down feeling at the lower end of the sternum. She had periods of nausea and vomiting and a slight cough, but neither hæmatemesis

nor hæmoptysis. She had lost about 20 lb. in the previous six months. There was distension of the veins on the right side of the neck, marked pulsation of the right carotid artery, and a to-and-fro murmur at the base of the heart, which was enlarged to a point just above the anterior axillary line. The right border was not abnormal. The chest moved poorly and there was enlargement of the upper mediastinal dullness to the left. The X-ray examination showed a marked transverse enlargement of the heart with an unusually high aortic knob. In December, 1930, she was unable to do much, and noticed swelling of both legs and thighs. In October, 1931, fever with sweats set in, acid-fast bacilli were found in the sputum, and she gradually sank, and died in November, 1931, with the symptoms of meningeal irritation.

Aneurysm of the descending thoracic aorta has been shown by G. Bourne² to produce a lateral thoracic jerk or pulsation. It can be both seen and recorded graphically. The movement is systolic and is not seen unless the aneurysm is on a level with the ventricles. Radiograms and tracings are given in confirmation.

In a Report of the New England Heart Association³ which includes several articles on cardiovascular syphilis, P. D. White refers to the *value of Wassermann reactions*, which are usually positive in cardiovascular syphilis. In the Massachusetts General Hospital from a small series of proved post-mortem cases of cardiovascular syphilis, 78.6 per cent showed a positive reaction.

TREATMENT.—H. H. Hazen⁴ reviews the treatment of cardiovascular syphilis. The ordinary methods of treatment for cardiac failure, if it is present, are necessary. An electrocardiograph is taken to determine whether coronary blockage is present or not. The outlook for a cardiac breakdown, according to Hazen, is not so dangerous in a person with sedentary habits. Those who have been treated by antisiphilitic remedies and who show signs of congestive failure should receive no antisiphilitic medication. On the other hand, in a paper by L. M. Blackford and J. H. Boland⁵ the authors strongly recommend intramuscular injections of **Sodium Bismuth Tartrate**. They have treated 150 cases by this remedy, and find that pain, which was the commonest symptom in 100 cases of aortic syphilis, was relieved in all but one case. Heart disease associated with syphilis showed marked clinical improvement. They strongly advise its use in congestive heart failure in any stage. In 47 cases this was present, and of these 6 were able subsequently to do manual labour and 15 were in a fair condition when last heard of, with no perceptible œdema. The dosage given is 2 c.c. of a 1.5 per cent solution of sodium bismuth tartrate twice weekly in a course of ten injections.

REFERENCES.—¹*Arch. of Internal Med.* 1933, March, 367; ²*Lancet*, 1932, ii, 66; ³*New Eng. Jour. Med.* 1933, Jan. 26, 177; ⁴*Jour. Amer. Med. Assoc.* 1932, Oct. 1, 1201; ⁵*Ibid.* Dec. 3, 1902.

TESTICULAR HORMONES. (See SEX HORMONES.)

TESTIS AND APPENDAGES, SURGERY OF.

Hamilton Bailey, F.R.C.S.

EPIDIDYMO-ORCHITIS.

It is not desirable, nor is it frequently possible, to distinguish inflammations of the body of the testis from those of the epididymis.

The Treatment of Acute Epididymo-orchitis in General.—Unless abscess formation makes it imperative, operative treatment for acute epididymo-orchitis appears seldom to be undertaken in England. Certain American and Continental surgeons consider that too conservative treatment is the cause of unnecessary suffering, recurrence, chronicity, male sterility, and even

testicular atrophy. B. W. Turner¹ states that the question of medical v. surgical treatment of acute epididymo-orchitis should be limited to a single trial of rest in bed with the organ supported on a bridge of adhesive (*Fig. 92*).

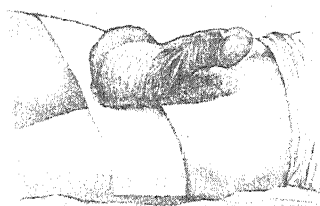


Fig. 92.—A sling for the testicles. Broad adhesive is employed to make the sling.

Ice applications are employed for forty-eight hours, and if the pain and swelling begin to subside, heat is substituted for the ice. If the swelling continues or extends higher, Turner considers it a mistake to wait more than five days. It is his advice to operate on all cases which do not subside within this period, and earlier in cases of 'pan-epididymitis'. By 'pan-epididymitis' is meant an involvement of the entire epididymis, vas, and the spermatic cord.

OPERATION.—Local anæsthesia is used, unless the cord and vas are involved, when spinal anæsthesia is employed. The organ is explored through a lateral incision from the outer surface of the scrotum, exposing the entire epididymis and cord for 2 in.

Step 1.—The epididymis is freed from adhesions and the cord separated from its bed. The vas is exposed and a hollow needle inserted into its lumen. By means of the needle acting as a cannula the vas is catheterized with a strand of silkworm gut. If the vas is patent and no pus exudes, its sheath is closed with a catgut suture. *If pus is present*, the silkworm gut is left in place and brought out through the skin at the upper angle of the wound.

Step 2.—When a secondary hydrocele sac is present it is incised. This is done through a simple longitudinal incision at a point opposite the epididymis.

Step 3.—An incision is made over the entire epididymis, which is separated from its sheath by a blunt dissection (*Fig. 93*). The epididymis is probed systematically with a sharp instrument in search of an abscess. A piece of rubber drain is inserted and the sheath united over the drain. The wound is closed and the drains removed upon the third or fourth day.



Fig. 93.—Incision for decompression of the epididymis. (After B. W. Turner.)

Gonococcal Epididymo-orchitis.—Very favourable results are reported from the East of the use of a 7.5 per cent solution of **Calcium Chloride** administered intravenously. The chief symptom following the injection is a sense of heat all over the body, but this lasts only a few moments, and no other untoward symptoms have been reported. Often within twenty-four hours the inflamed painful testicle begins to assume a normal appearance. This dramatic effect is seen particularly in acute cases, and, curiously, the urethral discharge is quite unaffected. S. Rama Iyer² recommends the following: 2 drachms of calcium chloride are dissolved in an ounce of distilled water (this is the stock solution); 2 c.c. of this are boiled in a test-tube and drawn into a sterile 10-c.c. syringe, into which freshly prepared normal saline is added up to 7 c.c. The contents of the syringe are then injected intravenously, very slowly. Zung Dau Zau³ records 58 cases of acute gonorrhœal epididymo-orchitis from the Peking Union Medical College Clinic treated by intravenous injection of calcium chloride. In only one case was there no benefit from the treatment. In

many cases only one injection was necessary to produce a gratifying improvement, but in the majority of cases several injections were necessary at intervals of between two and five days. In all cases the treatment was ambulatory and the patient was allowed to go home with a suspensory bandage.

B. Coli Epididymo-orchitis.—Epididymo-orchitis due to *B. coli* sometimes occurs idiopathically, especially in individuals run down with overwork. Heitz-Boyer (quoted by L. Strominger⁴) refers to an enterogenital syndrome in which there is a chronic colon bacillus infection of the epididymis without urethral infection. When the infection is acute constitutional symptoms are often severe. M. H. King⁵ describes a case of a base-ball player who became infected after intercourse with his wife, who at the time had just made a clinical recovery from a serious *B. coli* infection of the urinary tract. The temperature rose to 103.5° and an abscess of the epididymis was drained. G. Calissano's⁶ patient, a boy of 15, an active pederast, also developed an abscess which necessitated drainage. This author speaks highly of injections of stock vaccines of colon bacillus.

Typhoid and Paratyphoid Epididymo-orchitis.—Typhoid orchitis tends to suppurate. Of 2500 cases of the typhoid group analysed by A. E. Webb Johnson,⁷ 4 patients developed epididymo-orchitis. All of them were of the paratyphoid group, and in each instance the patient had bacilluria.

Staphylococcal Epididymo-orchitis.—E. B. Raymond⁸ records ten cases of staphylococcal epididymo-orchitis in patients aged from 21 to 50. Acute staphylococcal epididymo-orchitis usually develops in the course of a general staphylococcal infection. The chronic variety presents many of the features of tuberculosis of the testis, and the diagnosis can be made only by repeated clinical and bacteriological examinations. It is most important to recognize this condition, for its prognosis is consistently favourable. In contrast to tuberculous infection, the condition usually resolves. If suppuration occurs, a simple incision is all that is required. This brings home the paramount importance of distinguishing staphylococcal from tuberculous epididymo-orchitis.

Orchitis of Mumps.—Orchitis develops in about 18 per cent of males suffering from mumps. The testis, usually the right, becomes swollen and painful when the parotid inflammation is waning. Rarely, the testicular precede the salivary manifestations. Resolution always occurs. Orchitis of mumps is generally conceded to be mainly, if not entirely, limited to the body of the testis, i.e., orchitis pure and simple, and it is therefore interesting to hear what G. G. Smith (quoted by W. D. Bieberbach and F. Vibber⁹) found in two cases which he explored, findings which emphasize the wisdom of refraining from referring to orchitis apart from epididymitis (H. Bailey and R. J. M. Love¹⁰). At each operation, on opening the tunica vaginalis there was an escape of about an ounce of turbid yellow fluid. The testicle was considerably enlarged, the colour bluer than normal, and punctate hæmorrhages were scattered over the tunica albuginea. *The epididymis was red and the globus major almost black.* The cord was somewhat œdematous and the vas normal. A piece removed for histological examination showed signs of acute inflammation. No bacteria could be isolated. From various sources it appears that fully 55 per cent of cases of orchitis of mumps are followed by atrophy of the testis. It often takes many months before signs of testicular atrophy become apparent. [Such a high percentage of cases of testicular atrophy would appear to indicate that an operation such as Turner suggests (*see above*) is more than justifiable, particularly in these young subjects.—H. B.]

Tuberculous Epididymo-orchitis.—Apparently spermatozoa never carry tubercle bacilli, nor has it been proved that prostatic fluid harbours this

organism. Therefore it is improbable that a female is ever infected by semen of a male with genital tuberculosis.

DIAGNOSIS.—Adhesions of the epididymis to the skin of the scrotum and later a sinus discharging creamy pus, together with a craggy epididymis, are classical, but late, signs of testicular tuberculosis. A. C. Morson,¹¹ while stressing the importance of examining the testicle with the patient standing before the seated clinician, calls attention to *two very early signs*.

1. *Changes in the Skin.*—In tuberculosis there is often a loss of elasticity, as shown by smoothing out of the rugæ and wasting of the cellular tissues immediately beneath the dermis.

2. *Loss of Mobility of the Testis on the Affected Side.*—Normally the organ can be moved freely within its coverings, particularly in an upward and downward direction. This movement is often restricted in tuberculosis.

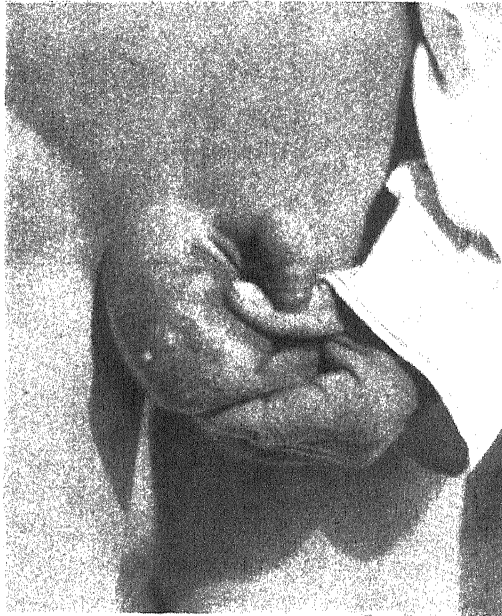
In early cases Morson advocates division of the vas (*see* VAS DEFERENS, p. 473) in addition to energetic general treatment. The object of severing the continuity of the vas is two-fold. If the testis is infected by way of the blood-stream, the vas is divided in order to prevent vesicles becoming diseased, and vice versa. Epididymectomy, in Morson's opinion, is a poor procedure; in necessary cases he performs orchidectomy. A. E. Webb Johnson urges those who treat genital tuberculosis by purely medical measures to consider the advisability of performing early epididymectomy on the affected side and tying the vas on the opposite side. The latter is an endeavour to prevent the healthy testis from becoming infected, and the former will often obviate that unpleasant but only too frequent complication, a discharging sinus in the scrotum (*Plate LIII*). V. Alberti has practised with success the following conservative operation in comparatively early cases. He excises the affected part of the epididymis beyond the limits of the disease, and then by means of interrupted catgut sutures performs end-to-end anastomosis of the two stumps; when the whole epididymis has to be removed the distal part of the vas is united to the tunica albuginea of the upper part of the testis. The results of this operation have been most successful, and restoration of complete functional activity has been obtained in most instances. C. A. R. Nitch reviews his cases of genital tuberculosis treated by radical surgical methods. When the corresponding vesicle is diseased, but the tuberculous process is apparently confined to one side, he performs orchido-vaso-vesiculectomy. He finds that 52 per cent of his patients are apparently cured, whereas, when epididymectomy or orchidectomy is alone carried out, 46 per cent remain free from recurrence.

The majority of speakers at a discussion on this subject at the Royal Society of Medicine were opposed to extensive surgical measures, which include removal of the seminal vesicle. All agreed on the necessity for efficient general treatment. The views expressed upon the value of tuberculin in genital tuberculosis were conflicting.

Malignant Disease of the Epididymis.—Malignant disease of the epididymis is probably not exceedingly rare. P. Jaisohn and E. V. Jordan¹² suggest that in practically every case which has been reported the original diagnosis was one of chronic epididymitis. The reviewer made an erroneous diagnosis in a case of this kind during the past year, and A. C. Morson¹¹ cites an instance where a patient with primary carcinoma of the epididymis with secondary deposits in the lungs was sent to a sanatorium diagnosed as tuberculosis. The reason why this condition is included in the section on inflammations of the testis will be evident, and the reader, when confronted with a hard nodule in the epididymis, is urged to consider the possibility of malignant disease. (C. A. Coleman, J. A. Mackie, and W. M. Simpson.¹³)

PLATE LIII

TUBERCULOUS EPIDIDYMO-ORCHITIS

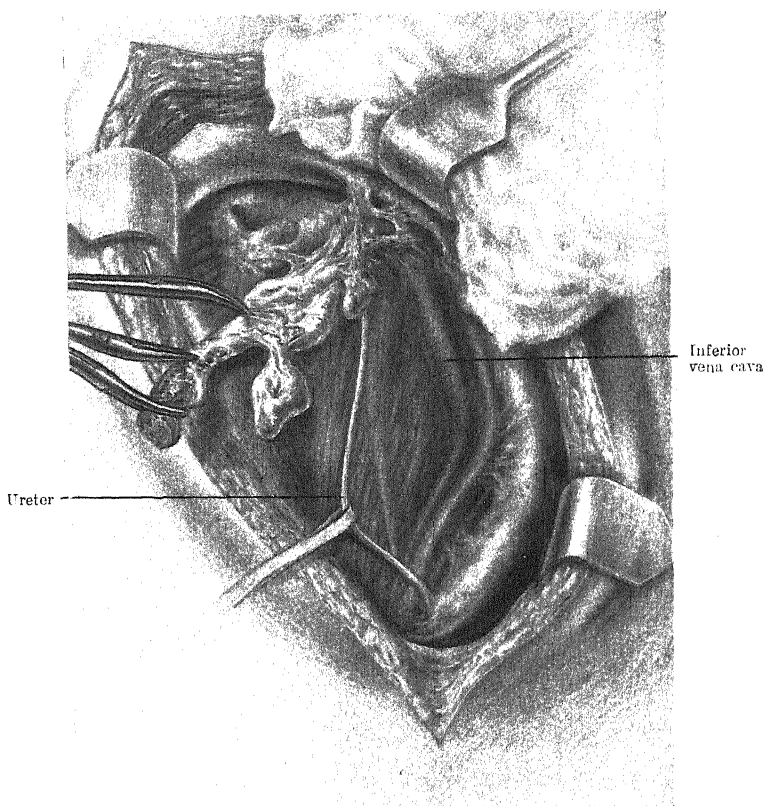


A discharging sinus in the scrotum complicating a case of genital tuberculosis.

PLATE LIV

OPERATION FOR
MALIGNANT DISEASE OF THE TESTIS

(P. HINMAN)



The complete operation for malignant testis. Block dissection of the ilio-lumbar glands.

OTHER AFFECTIONS OF THE TESTIS AND EPIDIDYMISS.

Polyorchidism.—Supernumerary testes are not nearly as common as was believed in remote times, when cysts of the epididymis and other swellings were mistaken for extra testes. R. H. Boggon¹⁴ describes a case of a baker, aged 23, who had orchidectomy performed on the left side for recurrent torsion. Examination of the specimen showed that there was an accessory testicle communicating with a common epididymis. The right testis was normal.

Anorchism.—The only method of being certain that a testis is not present is a complete post-mortem examination. V. S. Counseller and M. A. Walker¹⁵ supply an attractive theory for this abnormality. It is well known that in cryptorchidism the body of the testis is separated from the epididymis. In anorchism this separation becomes complete (Fig. 94).

Maldescent of the Testis.—

So long as a testis remains in the inguinal canal or the abdomen it does not develop normally. For this two explanations

are given: (1) The scrotum is a thermo-regulating mechanism, and for active spermatogenesis the testes must be kept at an even temperature slightly below that of the normal body temperature; (2) The testis is an organ intolerant of pressure, and for its proper development it must be suspended in a loose sac—the scrotum.

The hazards of maldescent of the testis are:—

1. *Hernia.*—Approximately 75 per cent of imperfectly descended testes are associated with inguinal hernia.

2. *Torsion.*—This occurs much more frequently in the maldescended organ.

3. *Pain.*—Particularly when the testis is situated in the inguinal canal testicular pain is usually in evidence.

4. *Malignancy.*—A conservative summing up of this delicate question would indicate that there is at least a slightly increased tendency to neoplastic formation.

Does Late Descent Ever Occur?—There is a widespread and deep-rooted belief that if a young boy with maldescended testis is left alone the organ will drop into the scrotum at puberty. H. Bailey¹⁶ has encountered a few cases where a concomitant hernia had been treated by operation early in life but no attempt had been made to bring down the testis—proof indeed of an implicit faith in the doctrine of late descent. Examples of patients and their hopeful parents waiting in vain are plentiful, but it has not been his lot to encounter a single instance of descent after the second year.

The Age at which Operation should be Performed.—If ten cases of imperfectly descended testes are operated upon above the age of 15, seven are likely to be failures. Such a high percentage of failures naturally brings orchidopexy into disrepute, and it is the operation rather than the delay in performing it which is blamed. The majority of surgeons agree that unless there is a large concomitant hernia making the operation during early life almost a necessity, the age of election for orchidopexy is between the 7th and 11th years. If the spermatic vessels are divided, atrophy of the testis is inevitable. O. H. Wangenstein¹⁷ insists that adequate mobilization of the spermatic vessels is the significant and essential factor in successful orchidopexy. D. Browne,¹⁸ in an anatomical

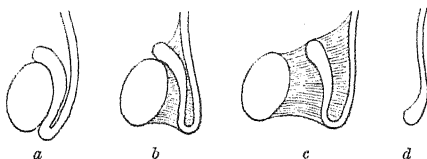


Fig. 94.—The evolution of anorchism. *a*, Normal testis; *b* and *c*, Separation of body from epididymis as seen in maldescended testis; *d*, Separation complete—the body is lost. (After Counseller and Weekes.)

study of the subject, concurs with this view. It would appear that the common factor in the numerous methods of performing successful orchidopexy is thorough mobilization of the spermatic vessels without injuring them.

(See also UNDESCENDED TESTIS, p. 475.)

Malignant Disease of the Testis.—The controversy regarding the correct treatment of malignant disease of the testis continues. Those interested in the subject can be said to be divided into two camps: (1) Those who in all cases practice simple *orchidectomy plus deep radiation* focused particularly upon the lumbar glands; (2) Surgeons who, in suitable cases, embark upon a *radical operation* which consists in removing the testicle and its entire lymphatic field (*Plate LIV*). While none can deny that some remarkable results have followed simple orchidectomy and radiation, the conservative school have written a good deal calculated to exaggerate the difficulties, and particularly the dangers, of the complete operation. In at least one instance the author condemning the procedure on account of its gravity admits that he has never even seen it performed! That removal of the testicular lymphatic field is not particularly dangerous is emphasized by the following figures: More than 100 cases of radical resection have been performed by American surgeons, with a single operative death, and that from pneumonia ten days after the operation (F. Hinman¹⁹). Nineteen consecutive operations were carried out at the London Hospital without mortality (A. E. Roche,²⁰ quoting Cairns).

All observers are now agreed that a large number of testicular neoplasms are teratomata. According to H. Dew²¹ they are, in round figures:—

	Per cent
Teratoma	50
Carcinoma (or so-called seminoma) ..	49
Sarcoma	1

The seminoma is found particularly in sexually mature men between the ages of 30 and 45 (K. Brandes).²²

F. Hinman, after a most careful study of this subject, states that while *the seminoma (carcinoma) is radio-sensitive, the teratoma is not*. If this is so, radiotherapy in the majority of testicular neoplasms is futile. On the other hand, radiotherapy should be employed with or without a radical operation in every case of seminoma. A. L. Keyes²³ has noticed that the very cases which are quite incurable by surgery because of their malignancy—i.e., those with massive secondary deposits—are sometimes the most radiosensitive.

The importance of early diagnosis of malignant testis was dealt with in the MEDICAL ANNUAL last year (p. 477). There is still too much delay in exploring suspicious cases. As C. H. Carlton²⁴ says, it is better to remove a normal testis than to leave an early case of one of these intensely malignant tumours. That a timely *radical* operation offers the best chance of permanent success is emphasized by the following summary of Hinman's investigations:—

	CASES	DEAD	ALIVE AFTER 5 YEARS
Radical operation	80	29	17
Orchidectomy with or without radiation ..	258	118	17

(See also MALIGNANT DISEASE OF THE EPIDIDYMS, p. 470)

Hydrocele.—W. Gerhardt²⁵ speaks highly of the following simple operation. Under local anaesthesia and through an incision 3 cm. long, the hydrocele is exposed. The upper end of the sac is opened and the fluid evacuated. Then the whole of the sac, including all its corners, is swabbed with a 10 per cent **Formalin Solution**, afterwards wiping it dry so as to leave no trace of the formalin. The little operation is completed by suturing the skin. An

inflammatory œdema usually follows, but this subsides rapidly. The average time of discharge of the patient was on the sixth day.

Ambulatory Operative Treatment.—K. Kettel²⁶ reports remarkable success of the ambulatory operative treatment of hydrocele at the Communal Hospital, Copenhagen. Under local anæsthesia Kirschner's operation is performed. The patient is sent home in an ambulance, and comes up on the fourth day for a change of dressing. In 134 cases there are only 6 recurrences.

N. J. Kilbourne and C. J. Murray²⁷ find the **Injection Treatment** of hydrocele satisfactory. The hydrocele is tapped, and at the first injection 2 to 4 c.c. of **Quinine Hydrochloride** (13.33 per cent) with **Urethane** (6.66 per cent) is used. The hydrocele fluid reaccumulates after the first injection. The second injection treatment is usually given one week later, and if this is not entirely effective, a third injection is given in three weeks. At the second and third injection the authors use 3 c.c. to 10 c.c. of the solution.

Steinach's Rejuvenation Operation.—Vasoligature or 'rejuvenation', after a tremendous boom a few years ago, seemed to have almost faded from current medical literature. Steinach himself proved that in rats, when the vas was divided and ligatured, the interstitial cells of the testis hypertrophied; as a result old rats became more active. In man, many scientific observers have been left unsatisfied as to the claims for this method of rejuvenation. H. Benjamin,²⁸ of New York, after reviewing his 300 cases, seems to be more than pleased with the late results. He finds that in 75 per cent of the cases the operation was worth while. Not only have a number of patients lost their symptoms of senility, but an increased growth of hair, decidedly better pigmented, was noted. In some instances he combines vasoligature with **Steinach's Second Operation**. This consists of making an incision into the tunica albuginea and removing the testicular substance which protrudes. According to Steinach the excision of some of the external secretory tissue stimulates the interstitial cells to still further hypertrophy. P. Schmidt, a great enthusiast for the method, went to Shanghai and operated upon elderly Chinese prisoners, who did not know why, or for what, the operation was performed (quoted by Benjamin). Under these truly scientific premises it is stated that prison officials and others noted many striking results.

VAS DEFERENS.

The vas deferens has very little contractile power. Spermatozoa reach the seminal vesicles by their own motile power. When the vas is ligatured it is uncertain what happens to the imprisoned spermatozoa. A. C. Morson²⁹ considers that in all probability the overcrowding soon causes a cessation of spermatogenesis, and a testis with its duct ligated becomes physiologically impotent for all time. Division of the vasa in no way affects the prostate, and the quantity of secretion ejaculated during an orgasm is the same as before vasoligature. The most noticeable—indeed, the only—change to be observed in the sexual apparatus after vasoligature is atrophy of the vesicles, and it is not long before these structures become so attenuated that they are no longer palpable per rectum.

The great value of vasoligature as a preventive of the troublesome complication of orchitis following operations upon the prostate was stressed in the *MEDICAL ANNUAL* last year (p. 476). Morson advocates that this simple procedure should be practised as a routine measure in cases of genito-urinary tuberculosis to prevent infection passing from the tuberculous testis to the vesicle, or vice versa.

The Vas Deferens and Male Sterility.—A. L. Wolbarst³⁰ is satisfied that by far the commonest cause of male sterility is bilateral stricture of the vasa.

Stricture of the vasa with obstruction to the passage of spermatozoa is found frequently without coexisting epididymitis.

J. Sequy and Vineaux³¹ describe an effective method of examining spermatozoa in cases of sterility. The specimen is obtained fresh by masturbation and collected in a Petri dish taken from an incubator. The dish is returned to the incubator for five minutes, after which the specimen is more fluid and homogeneous. A drop is then placed on a slide, covered with a slip, and examined with a No. 7 objective and a No. 3 eyepiece. A hundred or more

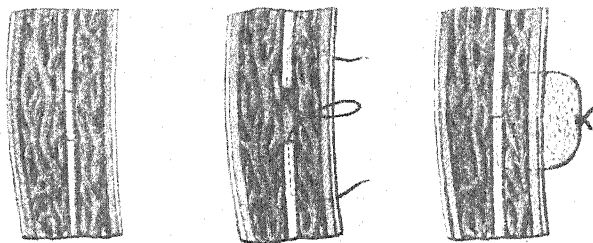


Fig. 95.—Method of excision of a stricture of the vas, with end-to-end anastomosis by means of a strand of silkworm gut. (After B. W. Turner.)

spermatozoa can be seen in the field at this magnification; below 50 is definitely low. Normal mobility is straightforward progression across the field in a few seconds.

When a tentative diagnosis of stenosis of the vas is made A. L. Wolbarst performs exploratory vasotomy. The vas is exposed as close as possible to the epididymis, a fine puncture is made in its wall, and a piano-wire is introduced as far as it will go. This is followed by an injection of sterile water coloured with mercurochrome on one side, and a 5 per cent solution of argyrol on the other for differential identification. For medication of the entire tract Wolbarst finds that 5 per cent argyrol is effective and less irritating than many other solutions.

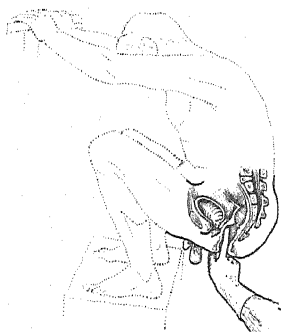


Fig. 96.—Lays' method of examining the seminal vesicles in a difficult case.

B. W. Turner³² describes an operation which he has found effective in certain cases of male sterility. The vas is exposed and if a nodule is found along its course this may be the principal if not the only seat of obstruction to its lumen. The nodule is excised and portions of the vas are snipped away until there is a patent lumen in each end. Anastomosis is

effected with a strand of silkworm gut (Fig. 95). The suture is removed on the fourth day.

VESICULÆ SEMINALES.

Examination of the Vesiculæ Seminales.—When the patient is obese or the prostate is enlarged examination by palpation of the vesicles becomes

a difficult matter. In such circumstances G. Luys³ recommends that the examination should be made with the patient in the position indicated in *Fig. 96*.

REFERENCES.—*Jour. of Urol.* xxvii, No. 3, 359; ²*Indian Med. Gaz.* 1929, Feb. 20, 77; ³*National Med. Jour. of China*, 1928, Dec. 28, 368; ⁴*Presse méd.* 1931, June 6, 836; ⁵*Amer. Jour. Surg.* 1932; ⁶*Ann. ital. di Chir.* 1931, Aug.; ⁷*Proc. Roy. Soc. Med.* 1933, 796; ⁸*Thèse de Paris*, 1932, 750; ⁹*Jour. Amer. Med. Assoc.* 1932, April 8, 301; ¹⁰*Short Practice of Surgery*, 1932, 301; ¹¹*Proc. Roy. Soc. Med.* 1933, 796; ¹²*Jour. Amer. Med. Assoc.* 1933, April 1, 1021; ¹³*Surg. Gynecol. and Obst.* 1932, July, 111; ¹⁴*Brit. Jour. Surg.* 1933, April, 630; ¹⁵*Ann. of Surg.* 1933, July, 104; ¹⁶*Post-graduate Med. Jour.* 1933, July, 247; ¹⁷*Surg. Gynecol. and Obst.* 1932, Feb., 219; ¹⁸*Lancet*, 1932, i, 460; ¹⁹*Surg. Gynecol. and Obst.* 1932, Feb., 450; ²⁰*Proc. Roy. Soc. Med.* 1933, June, 1063; ²¹Quoted by Bailey and Love, *Short Practice of Surgery*, 305; ²²*Zentrabl. f. Chir.* 1932, Dec. 10, 3013; ²³*Surg. Gynecol. and Obst.* 1933, Feb., 462; ²⁴*Practitioner*, 1933, Feb., 225; ²⁵*Zentrabl. f. Chir.* 1932, Sept. 3, 2159; ²⁶*Hospitalstidende*, 1932, March 24; ²⁷*Calif. and Western Med.* 1932, July, 3; ²⁸*American Med.* 1932, Dec., 467; ²⁹*Brit. Med. Jour.* 1933, Jan. 14, 54; ³⁰*Jour. of Urol.* 1933, April, 425; ³¹*Rev. med. franç.* 1932, Oct., 683; ³²*Jour. of Urol.* 1932, March, 367; ³³*Maladies des Vésicules séminales*, 1930. Paris.

John Fraser, Ch.M., F.R.C.S.Ed.

Torsion of Appendix Testis.—Attached to the upper end of the testis there is a small pedunculated body—the appendix testis, sometimes known as the hydatid of Morgagni. It is the vestigial remnant of the upper end of the Müllerian duct, and it corresponds to the uterine tube of the female. Its type of attachment to the testis varies—in some instances its base is relatively sessile, occasionally its connection is in the form of a delicate pedicle, and it is in the latter instance that the risk of torsion exists. (For illustration, see MEDICAL ANNUAL, 1933, p. 474, *Plate XLVII*.)

C. H. Foshee¹ reports two cases of this disorder. The usual history is somewhat as follows. A boy complains of swelling and tenderness on one side of the scrotum; there is no rise of temperature, and practically no general disturbance. Operation shows a hæmorrhagic infarction of the appendix testis, the change passing into the upper pole of the testis proper. In so far as the diagnosis is concerned the condition may be impossible to distinguish from true torsion of the spermatic cord. The cause of the error is probably a sudden cremasteric reflex acting upon an unduly pedunculated appendix testis.

The treatment is to remove the affected segment, and operation should not be delayed in case the body of the testis becomes unduly affected.

Undescended Testis (see also MALDESCENT OF THE TESTIS, p. 471).—In recent years there has been an increasing amount of interest in the subject of undescended testis, no doubt for the reason that there has been a certain measure of dissatisfaction with the operative results obtained in cases of this type.

Hamilton Bailey² reviews the position from a general point of view. He has some interesting things to say in regard to the function of the scrotum. He rejects the view that it is a thermo-regulating mechanism (Wangensteen), and prefers to regard the testis as an organ intolerant of pressure, believing that the function of the scrotum is to ensure to the testis a freedom of movement and indirectly a sufficiency of blood-supply. He puts forward the hypothesis that in virtue of its rich sympathetic plexus, pressure reflexly causes the testicular blood-supply to be cut down so that the organ hibernates, and conversely that when the testis is suspended in the scrotum "the gentle undulation of the ever-contracting and relaxing dartos may call forth a vasodilator reflex, so that the fully nourished secretory cells increase and multiply". It is obvious that it is difficult, even impossible, to prove or disprove such a theory.

Hamilton Bailey is also critical of the teaching in regard to the explanation of the descent of the testis, but he has to confess that he has no better theory to offer, though he is satisfied that the influence must be sought elsewhere than in the gubernaculum. He quotes the influence of intra-abdominal pressure, but he recognizes that such an influence will scarcely explain why the left testis descends somewhat before the right. He is doubtful if late descent ever occurs; he discusses the hazards of maldescent, hernia, torsion, pain, and malignancy, and in passing it may be noted that he regards the last as a definite possibility.

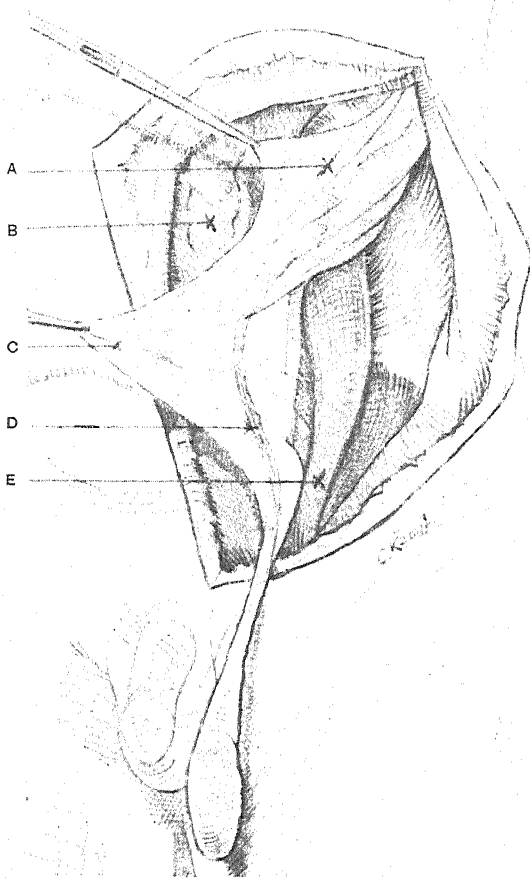


Fig. 97.—Dissection showing the layer of tissue in which the spermatic vessels run, isolated between the peritoneum on the inner side, and the muscle-sheath of the abdominal wall on the outer. A fan-shaped prolongation of its fibres can be seen running down with the cord towards the testis, which has been pulled out of the scrotum. A, Kidney in its fibrous sheath; B, Peritoneum covering intestines; C, 'Abdominal connective tissue'; D, Spermatic vessels; E, Psoas muscle.

(Figs. 97, 98 by kind permission of the 'Lancet'.)

In regard to the most suitable time for operation he quotes the majority opinion as being in favour of a period between the seventh and the eleventh years. This is an interesting conclusion, because we would have said that to accept the view that an undescended testis degenerates would seem to imply that the earlier the operation is performed the more likely is it that the function of the organ will be preserved. Hamilton Bailey is satisfied that the spermatic vessels constitute the main barrier to replacement, and in so far as

operation is concerned, he indicates that any procedure which is likely to ensure laxity of attachments while safeguarding the blood-supply will probably be efficient. He concludes thus: "the method by which the organ is held in the scrotum is of secondary importance".

A very similar view is expressed by F. Schüick,³ who points out that, assuming that sufficient relaxation of testicular attachments and supports is secured, the method of fixation within the scrotum is of secondary significance. In so far as the age question is concerned, this author favours a period between the ninth and the twelfth years.

In operating on undescended testis it is recognized that the real crux of the problem lies in securing sufficient relaxation, and in this connection there is much important information to be found in a paper by Denis Browne.⁴ He asks the very pertinent question: "How is the testis supported in its normal position?"

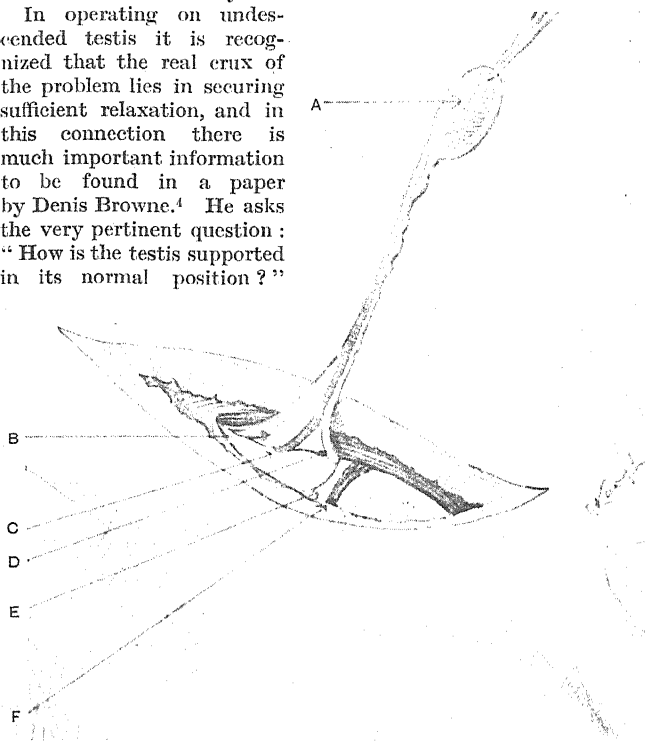


Fig. 98.—Drawing of an operation, showing a fan-shaped band of fibres spreading outwards and upwards from the spermatic vessels at the internal inguinal ring. The vas is seen turning at a sharp angle to join the cord, this angle being maintained by the fibrous internal crus of the internal ring. The deep epigastric vessels are running in the shelter of the internal crus, and take no part in bounding the ring. A, The testis; B, Fan-shaped expansion of suspensory fibres; C, Spermatic vessels; D, Vas deferens; E, Edge of internal crus of internal abdominal ring; F, Deep epigastric vessels.

The influence of the skin he rejects; dartos and cremaster muscles have a certain suspensory influence in so far as they contract and thereby raise the testis; the blood-vessels and the ductus deferens appear to have no real fixative value; and it is Browne's view that the real factor in opposing the pull of gravity is found in fibres distributed over the posterior abdominal wall. They are derived from a fibrous tissue layer which lies beneath the peritoneum, and which extends on the outer side of the spermatic vessels and upwards as far as the kidney (*Fig. 97*). Ensheathing the kidney

above, it includes the ureter and the spermatic vessels in its substance, and at the internal ring a portion of the same tissue accompanies the cord into the inguinal canal as far as the testis, and it would seem therefore that to divide this band would result in considerably increased relaxation of the testicular attachments. It is true that division is followed by a straightening out of the vessels and to some extent of the vas, but such a result leads to the vessels meeting the inguinal canal at an angle of 45° instead of curving gently into the axis of it, and, in order to secure a satisfactory alignment, it is necessary to divide a strong crescentic-shaped fibrous band, which ensheaths the inferior epigastric artery at this point (*Fig. 98*). Once this has been divided, the vessels and the vas can be displaced inwards with ease, and any undue angling corrected. On these lines Browne recommends that the operation for liberation of an imperfectly descended testis should consist in the division of the two structures mentioned above—the longitudinal fibres which run in continuity with the vessels, and the band which forms the median relation of the internal abdominal ring.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1932, July 23, 289; ²*Post-Graduate Med. Jour.* 1933, July, 247; ³*Arch. f. klin. Chir.* 1932, Sept., 821; ⁴*Lancet*, 1933, i, 460.

TETANUS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

A reference to back numbers of the MEDICAL ANNUAL recalls the methods of treatment recommended by the Committee presided over by Sir David Bruce during the War. In the MEDICAL ANNUAL, 1917 (p. 519) the War Office Committee recommended prophylactic doses of 500 U.S.A. units of **Anti-tetanic Serum** given subcutaneously. In about ten days' time the immunity conferred by this prophylactic injection is to a large extent lost. A second injection should therefore be given at an interval of about seven days. In long-continued septic wounds the immunity of the patient should be made certain by a third and fourth injection at seven-day intervals. The ordinary vial contains 1500 units.

Curative doses must be very much larger. The technique is as follows: 20 c.c. of cerebrospinal fluid are withdrawn and 20 c.c. of serum very slowly injected. If the serum used is of ordinary strength (150 units in 1 c.c.), the patient will then receive a dose of about 3000 units in about 20 c.c. At the same time, 5000 or 10,000 units should be injected intramuscularly, and about half this amount subcutaneously. The intrathecal injections may be repeated daily for three to five days. The intramuscular and subcutaneous injections are continued daily according to the severity of the symptoms.

B. B. Yodh¹ takes stock of the present situation regarding various methods of treatment. A well-ventilated dark room is very important, as by this means the external stimuli are considerably reduced. There should be silence in the ward. **Bromides, Chlorotone, Chloral Hydrate, and Hyoscyamus** are the usual sedatives employed. **Morphine with Atropine** may be useful when the spasms are very severe. The prolonged use of sedatives is attended with some danger. Several cases of drowsiness and even coma were noticed after the spasms had passed away. This writer avoids the use of chloroform, as the clinical impression was produced that pulmonary oedema supervened in a fair number of cases with fatal results. Much old ground is covered in this communication. Emphasis is properly laid on the necessity for radical treatment of a dirty, lacerated wound. Rectal saline alone may have to be relied on for nourishment for twenty-four or forty-eight hours. A marked increase in the pulse-rate and respiratory failure may be successfully met by injections of $\frac{1}{100}$ gr. of **Digitalin** and $\frac{1}{50}$ gr. of **Atropine** every three hours. **Antitoxin** cannot combine with the toxin that has already reached the nerve-cells, and

the only hope of getting better results lies in the early saturation of the blood and the immediate neutralization of all toxin that lies free in the cerebrospinal fluid. The memorandum on tetanus by the War Office Committee concluded that the intrathecal injections were the most effective.

Yodh advocates the injection of the antitoxin into the cisterna magna. The technique is simple if ordinary precautions are taken. The cisterna magna is situated in front of the occipito-atlantoid ligament at a distance of 4.5 to 6 cm. in the adult. It is not advisable to go beyond the 6 cm. The hair at the back of the head is shaved. The tips of the mastoid processes are important landmarks. The centre of the line joining these points is the point for puncture. It would be preferable to have the patient sitting up with the head flexed, but as this is not possible in tetanus the patient is made to lie on one side with the head flexed as much as possible. [Local anaesthesia is quite sufficient.—W. I. de C. W.]. A lumbar-puncture needle is then introduced in the centre of the line joining the tips of the mastoid processes and above the spine of the atlas, which is easily felt. The needle is pushed in slightly upwards till the edge of the foramen magnum is struck. The point of the needle is now slightly depressed and the atlanto-occipital ligament pierced. When the needle reaches the dura mater, and while it is piercing it, the patient feels a sharp twinge of pain. The needle should now be gently rotated and the cerebrospinal fluid then rushes out. It is wise to remove the trocar from time to time to see if the cistern is reached. As a rule the puncture is easy; 20 to 30 c.c. of the fluid are allowed to come out, and are then replaced by a slightly smaller amount of antitoxin. This must be done very slowly, at least two to three minutes being taken. The foot of the bed is raised to keep the fluid at a high level for as long a time as possible.

The writer concludes that it appears to be established that :—

1. The use of tetanus antitoxin in the treatment of tetanus is perfectly rational, is absolutely necessary, and should be used early and in large doses.
2. The combined intrathecal (cistern puncture), intravenous, and intramuscular method of administration is superior to all the others. It definitely lowers the mortality rate, and ameliorates the symptoms far more than does treatment by intravenous and intramuscular routes alone.
3. The administration of the antitoxin into the cisterna magna is preferable to lumbar puncture, as the former is nearer the vital centres. This method appears to neutralize any toxin that might be there quickly, and is much easier to perform.
4. The cistern puncture, properly performed, has no dangers. Not one single fatality could be attributed to the administration of the antitoxin by that route directly in a series of 112 cases. If the needle is not pushed beyond 5.5 to 6 cm. in adults there is no danger of puncturing the medulla.

H. L. Brown² advocates the use of **Chloroform** in severe tetanus cases, and describes an interesting case of the injection of antitoxin into the brain :—

“The patient was anaesthetized with chloroform, the head shaved and the scalp cleaned, a semicircular incision about $\frac{3}{4}$ in. in diameter, going down to the bone, was made in the scalp, and a hole large enough to admit the needle of a serum syringe drilled through the skull, at a point midway between the external angular process and the mid-point of the vertex, over the right hemisphere; 20 c.c. of serum were drawn into the syringe and the needle introduced vertically into the brain for a distance of 2 in. The needle was held very firmly to prevent any lateral movement, and the serum was injected very slowly—a few drops at intervals of half a minute—taking half an hour to complete the process.

"The effect was almost miraculous. During the rest of the day there were no more paroxysms, and he was decidedly more comfortable, the improvement lasting during the whole of the next day. On the following day, as there was a tendency to recurrence of spasm, although much less severe, I repeated the injection in the same spot."

REFERENCES.—¹*Brit. Med. Jour.* 1932, ii, 589; ²*Amer. Jour. Surg.* 1932, Aug., 24.

THROMBO-ANGIITIS OBLITERANS. (See also ADRENALECTOMY; BLOOD-VESSELS, SURGERY OF.) A. G. Gibson, M.D., F.R.C.P.

Lumbar Sympathectomy.—In the hands of E. D. Telford and J. S. B. Stopford¹ this would appear to be the ideal method in the treatment of *thrombo-angiitis obliterans*. Fifty operations have been performed since April, 1931, but the report is concerned only with the first 16 cases, because in the later cases a sufficient length of time had not elapsed to estimate the effect. The patients were all males, and three were of Jewish blood. The Wassermann reaction was negative in all but one case. Syphilis, they believe, has nothing to do with the disease. In the earliest stage of the disease vasospasm is the chief feature and the complaint is that the walking distance is progressively lowered. In 7 patients there were complaints of vascular disturbance, and in 1 case the classical symptoms of Raynaud's disease were present three months after the operation for lumbar sympathectomy. All the patients had found before operation that the dependent position together with cool air gave them the most comfort. In 4 patients no arterial pulse could be felt at any point below Poupart's ligament. An early symptom is onychia, which proved in several cases to be the starting-point of a massive gangrene. The evulsion of the nail in some of these cases had led to very painful and callous ulcers.

The operation consists in the removal of a section of both sides of the lumbar sympathetic cord by the transperitoneal route. The results show that the pulse after the operation in a few cases only becomes palpable lower than before the operation. The silent arteries for the most part remain without pulsation, and the beneficial effects are due to the dilatation of collateral vessels. Out of the 16 cases, 9 showed a good result; these patients became free from pain and were able to walk well. The relief of pain is one of the most striking results of the operation. Onychia showed a rapid healing, but when gangrene is present the outlook under sympathectomy is not good.

REFERENCE.—¹*Brit. Med. Jour.* 1933, Feb. 4, 173.

THYROID GLAND, DISORDERS OF. (See also HEART DISEASE—THYROID HEART.) W. Langdon Brown, M.D., F.R.C.P.

Aschoff, in speaking of endemic goitre recently, said that the brilliant progress in the last century had been followed by a period of relative exhaustion. It would be equally true to say this of the brilliant progress in the study of Graves' disease which followed the war. Harington has continued his researches on the chemistry of thyroxin and has shown it to be inactive unless it contains four iodine atoms, but on the clinical side there is not much of importance to report. One might single out as of interest the influence of cabbage in producing goitre, the value of cholesterinæmia in the diagnosis of thyroid disorders, and of fluorides in the treatment of Graves' disease. Each of these will be alluded to in the appropriate place.

Goitre.—The areas of endemic goitre are everywhere extending in size, while the intensity of the disease is gradually falling.¹ Holst calls attention to its incidence in Norway, despite its maritime position. Possibly this is related to weak intensity of sunlight during so much of the year, since

J. H. Smith² maintains from a geographical study of goitre that a deficiency of solar radiation tends to a deficiency of the iodine content of the gland due to a lack of irradiation of the air, soil, food, drinking water, and skin, and that this leads to an increased prevalence of goitre. Galli-Valerio¹ maintains that iodine is merely an antidote, in the same sense as quinine is an antidote for malaria, but that lack of iodine is not a cause of goitre, any more than malaria is due to a lack of quinine. Blum¹ maintains that there must be other factors, since no district in the world is so badly supplied with iodine that the meagre requirements of the body, amounting to only 0.05 mgrm. daily, cannot be supplied. R. McCarrison, Chesney, and Webster,³ and V. Suk,⁴ all stress the importance of some goitrogenous substance in cabbage. Spring and summer cabbages are said to be inert, while Suk attributes the high incidence of goitre amongst the Carpathian highlanders to excessive cabbage diet in the winter months. The toxic substance in cabbages was found to be insoluble in water, but freely soluble in ether. Marine thinks that it is connected with the mustard oils or cyanide precursors, which would depress oxidative processes. It is probable that all Cruciferae contain more or less of this substance. R. H. Rose⁵ revives the claim that gastro-intestinal infections play an important part in the production of goitre.

Relationship of Simple Goitre to Other Diseases of the Thyroid.—This subject appears still to arouse much controversy. J. W. Hinton⁶ maintains that it would be much simpler to regard the different goitres as stages of a continuous disease process and treat all cases medically unless hyperthyroidism, pressure symptoms, or an encapsulated tumour actually exists. In this way some of the nodular goitres that are called adenomata would be found to be colloid rests from connective-tissue formation, which would respond to iodine or thyroid medication, thus saving many needless operations. Marine also believes that there is no clear distinction between diffuse and nodular goitres, that the adenomata can change their appearance, that they can produce thyroxin, and that they are not, strictly speaking, neoplasms. It is rather surprising to note that such views received little support at the Berne Conference.

With regard to malignant disease of the thyroid, Wegelin stated that it is undoubtedly more common in endemic areas than in regions free from endemic goitre, and that 81 per cent of malignant cases develop in previously existing nodular goitres. Such malignant growths may be true 'endocrine' tumours. In von Eiselsberg's case¹ extirpation of a thyroid cancer was followed by myxœdema. This was relieved when a large metastasis appeared in the sternum. The metastatic growth enlarged and became painful with each menstrual period. It was removed and showed a structure identical with that of a normal gland. The myxœdema promptly reappeared.

Acute Colloid Goitre.—McCarrison spoke at Berne of an acute form of colloid goitre common in low-level countries and seen most often in boys at puberty. It may compress the structures of the upper thoracic aperture so completely as to become a surgical emergency. **Thyroxin** by the mouth may fail to cure, but given intravenously it rarely fails, according to Plummer.

Hyperthyroidism.

The Iodine Content of the Blood.—E. C. Dodds, W. Lawson, and J. D. Robertson,⁷ in confirming Lunde's claim that the iodine of the blood exists in two fractions, find that the alcohol-insoluble fraction is increased in all patients with toxic goitre and that it can be reduced by oral treatment with iodine, but that this reduction is not necessarily associated with a decrease in the basal metabolic rate or in toxicity. They conclude that the alcohol-insoluble fraction is not a measure of the toxic secretion by the thyroid.

Hyperthyroidism and Glycosuria.—H. J. John,⁸ following up his cases of

hyperthyroidism which had glycosuria, thinks that true diabetes occasionally, but rarely, follows, on account of a previous tendency which has been precipitated by the thyroid disease. In 100 dextrose-tolerance tests, fasting glycosuria was present in 19, whereas 66 curves indicated impaired tolerance. Renal permeability would therefore appear to be decreased in the active stage of hyperthyroidism. No sugar curve is specific in this condition, nor is there a strict relation between the severity of the thyroid disorder and the impairment of sugar tolerance. S. S. Lichtman⁹ finds some moderate impairment of the capacity of the liver in thyrotoxicosis as measured by the power to oxidize cinchophen. He did not find any appreciable disturbance of the excretory functions of the liver.

TREATMENT.—

Operative.—H. N. Chute and J. R. Veal¹⁰ put their cures by **Subtotal Thyroidectomy** at 94 per cent. At the same time, as will be seen below, there appears to be a reaction against surgical intervention in early cases, and a tendency to explore the possibilities of medical treatment rather more fully.

Non-operative.—J. Eason and H. L. Wallace,¹¹ making a ten-year survey of their cases of toxic goitre not treated by operation, find their results so good as to suggest that when time is not an important factor medical means should be given adequate trial except in severe cases of long standing. They are favourably impressed with the results of **Radium** treatment in ambulant cases. G. E. Pfahler¹² speaks highly both of radium and of **X Rays** in the treatment of thyrotoxicosis. J. M. Read¹³ stresses the importance of adequate dosage if X rays are used. I. Bram,¹⁴ in emphasizing the importance of psychotherapy in primary Graves' disease as opposed to secondary toxic goitre, reminds us that thyroidectomy leaves the underlying nervous tendency untouched. Elsewhere¹⁵ he insists on the importance of distinguishing the primary form—a katabolic neuro-endocrine dysfunction—from the secondary, a local condition which pours an excess of thyroid hormone into the blood. In the former the body upsets the thyroid, in the latter the reverse condition obtains.

Of the newer medicinal remedies recommended in Graves' disease, the **Fluorides**, first used by Goldenberg of Buenos Ayres in 1930, have been coming in for special attention. He offered no explanation of their action, but V. Gorlitzer¹⁶ attributes it to the general depressant effect of halogens on basal metabolism, fluorine being the most active in this respect. He has employed dilute hydrofluoric acid in a bath, and reports favourably of the results, but the method seems open to several objections. Goldenberg,¹⁷ in a more recent paper, attributes the effect to neutralization or precipitation of the thyroid hormone. He gives sodium fluoride intravenously, starting with 2 to 3 c.c. of a 2.5 per cent solution in distilled water. The dose is gradually increased by $\frac{1}{2}$ to 1 c.c. in each injection until clinical symptoms begin to abate, after which the dose is gradually reduced again. Injections are given at first every day or every other day, and are gradually spaced out as the patient improves. Fifteen to twenty injections in all will probably be required. He found the sodium salt tolerated badly when orally administered and preferred the ammonium salt.

A. F. Todd¹⁸ thinks that the toxicity of the sodium salt is due to irritation of the small intestine, and finds that he can avoid this by giving an astringent also. His method is as follows. Two solutions are prepared :—

1. 2 per cent Aqueous Solution of Sodium Fluoride	℥xxx
Lugol's Solution of Iodine	℥x
Water	to ʒj
2. Chlorodyne	℥v
Tr. Catechu	℥xv
Syrup	℥xx
Water	to ʒj

These two are mixed in equal parts and taken immediately after meals three times daily. It is best to start with half the amount of the first but full amount of the second for a few days, gradually increasing until equal parts are taken. A remission may be expected in about a fortnight. He is very favourably impressed by the method. [The reviewer has seen one case on the border line for operation which definitely and continuously improved on this treatment.]

Hypothyroidism.—Epstein and Lundé drew attention in 1922 to the high blood-cholesterol values found in myxœdema and noted their decrease after the administration of thyroid extract. Elwyn, in 1926, showed that the same obtained in lipid nephrosis. L. M. Hurxthall¹⁹ has extended these observations to various types of thyroid disease, and finds that the level of the blood-cholesterol and the basal metabolic rate vary inversely. Thus not only is the blood-cholesterol high in myxœdema, but it is normal in non-toxic goitre, while it is at its lowest in patients in or near thyroid crises, and lower in exophthalmic goitre than in toxic adenoma. Its level, therefore, appears to be a helpful guide as to the state of activity of the gland. E. H. Stokes²⁰ has also found this method valuable both from the point of view of diagnosis and of following the progress of treatment in ten cases of myxœdema.

J. W. Hinton²¹ calls attention to hypothyroidism as a factor in the causation of abdominal pain, and urges that this should be borne in mind when no other cause can be found. He attributes it to hypoperistalsis combined with pylorospasm.

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THYROID SURGERY.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Toxic Goitre.—In addition to the usual toxic physical signs and symptoms in Graves' disease, in almost every case a very slight widening of the palpebral fissure gives rise to a definite stare which is noticeable even in early cases. Furthermore, the patient, apart from tremor, seldom allows the hands to remain quiet for a moment. With the raised metabolic rate the appetite is abnormally good in the presence of loss of weight. There is a tolerance of cold and a corresponding intolerance of heat. The signs of muscular weakness can be easily demonstrated. During the clinical examination, if the patient is asked to get up on a high stool, difficulty is experienced owing to the weakness of the quadriceps muscles. Occasionally the high basal metabolic rate and loss of weight is absent. The reviewer mentioned such a case in the *MEDICAL ANNUAL* for 1924 (p. 464) in which there was protrusion of one eye and few other signs. The thyroid was not enlarged, but when removed showed all the histological features of toxic goitre.

Cases are reported from the Mayo Clinic¹ in which nervousness is the only complaint. A determination of the basal metabolic rate is a necessary aid in ruling out the presence of hyperthyroidism. In an occasional case the basal metabolic rate tends to confuse the diagnosis rather than to clarify it. Anxiety neurosis also may confuse the diagnosis. The basal metabolic rate may be raised, but not consistently raised if several examinations are made. The treatment of such cases is the lessening of work, responsibilities, and worries.

At the Mayo Clinic such patients are warned not to count the pulse. It is emphasized that, if the determinations of the basal metabolic rate taken on successive days show a decline to a normal level, a diagnosis of hyperthyroidism usually should not be made.

TREATMENT OF GRAVES' DISEASE.—Strong differences of opinion still exist on the relative merits of medical and surgical treatment. With regard to the latter, there is no condition in surgery which requires more judgement, experience, and skill. If an operation is performed under good conditions—i.e., by experienced surgeons, anaesthetists, and assistants—there is little doubt that operation is indicated in a large percentage of cases. With proper pre-operative preparation and a definite knowledge from experience how much each individual patient will stand in the way of operation at a given time, the mortality can be brought down to less than 2 per cent.

W. H. C. Romanis² states that a recent series of 650 cases published in *St. Thomas's Hospital Reports* has shown that the mortality of all cases treated in the surgical wards is about half that of all the cases treated in the medical wards. He states that ligation of one or more of the thyroid arteries is very seldom done now. [Nevertheless there are still patients who do not respond to Lugol's solution sufficiently to make operation safe, and it is wise to test the reactions of the patient by performing the minor operation first. The reviewer finds that the superior thyroid artery can be rapidly ligatured under gas-oxygen or local anaesthesia by making a small vertical incision in the region of the upper pole of the gland. Superficial bleeding is ignored. A fully curved needle carrying catgut is passed round the tissues in the region of the upper pole. The operation can be performed in three or four minutes. The reviewer asked Crile for the exact landmarks, and this brilliant authority replied, "The landmarks are always difficult to find, but the artery never is".—W. I. de C. W.]

Schmidt³ gives some particulars of deaths due to thyrotoxic myocarditis; those due to degenerative changes occurring in the liver, kidneys, and pancreas; and those due to accident and failure of operation. Eighty per cent of the operations were performed under gas-oxygen anaesthesia. Great care, he states, must be taken to prevent injury of the viscera (liver, pancreas, and kidneys) in Graves' disease. Avertin is used in only a small, well-chosen group of cases.

With regard to pre-operative treatment, it may be a matter of days or, in cases of crisis, of several weeks or months before the patient is ready for the surgical ordeal. It is here that the co-operation of the physician and surgeon is so important. In an average case, assuming that septic teeth and tonsils have been removed, ten days' preparation in hospital, giving 5 min. of **Lugol's Solution** three times a day, with ample rest, fluids, glucose, etc., is sufficient. The patient need not necessarily be kept in bed.

As a working basis it may be stated that the more gland that is taken away at operation, the better the results. There is, perhaps, some risk in leaving a small amount of gland in the region of the inferior thyroid artery for the purpose of protecting the parathyroids and the recurrent laryngeal nerves. Small portions of gland may be responsible for persistent post-operative symptoms. A second operation may be necessary in such cases. Permanent hypothyroidism, following complete or almost complete removal of the thyroid gland in cases of Graves' disease, is very rare. Such cases can be controlled by the administration of thyroid extract. It is much more common to find hyperthyroidism resulting from leaving too much gland behind.

Anaesthesia.—The best anaesthetic in the experience of the reviewer is **Colonic Ether** administered by modern methods and preceded by a hypodermic

injection of **Morphia**. The line of the skin incision is deeply infiltrated with $\frac{1}{2}$ per cent novocain solution without adrenalin. This infiltration can be safely carried into the region of the upper and lower poles before commencing the operation. As an alternative, **Gas-oxygen Anaesthesia** is employed by many experts. It has the obvious advantage of allowing the patient to come to and articulate at any given moment. Injury to the recurrent laryngeal nerves can be avoided in this way. Some years ago the bad surgical risk was operated upon with local anaesthetic alone, preceded by morphia; but colonic ether does not appear to have any deleterious effect. Romanis recommends **Avertin** in all but the severest cases, combined with a minimum amount of gas-oxygen. The dose of avertin should be slightly greater per pound body weight than one would give to ordinary abdominal cases. One of the advantages of colonic ether over gas-oxygen anaesthesia is that the anaesthetist and his apparatus are entirely out of the way. The disadvantage of colonic ether is the time taken for induction. To put a patient quietly to sleep under colonic ether without fuss or fear on his part requires nearly an hour.

Lingual Thyroid.—R. H. Miller⁴ refers to lingual goitre and pathological changes in the lingual thyroid. Lingual thyroids occur only once in about two thousand cases. About one hundred cases have been recorded in the literature. The gland is observed as a smooth, reddish tumour protruding upwards from the base of the tongue, without tenderness, and rather firm. It is redder than the tongue itself. On pulling the tongue forward the uvula rests on top of it. Pathological developments such as colloid nodules, the changes of exophthalmic goitre, or even malignancy may cause symptoms. The illustrations accompanying the article show a photograph of a case of lingual goitre and a diagram of the method of exposure for operation.

Division of Platysma.—In operation for goitre the platysma muscle should not as a rule be divided. The fibres can be separated and retracted with the strap muscles; by this means later stretching of the skin scar is avoided.

Significance of Nerve Paralysis.—Apart from the presence of goitre or other tumour of the neck, if the phrenic nerve or the recurrent laryngeal nerve is found paralysed, cancer of the lung should be suspected.

REFERENCES.—¹*Proc. Staff Meetings Mayo Clinic*, 1933, Nov. 1, viii; ²*Brit. Med. Jour.* 1933, i, 88; ³*Surg. Gynecol. and Obst.* 1932, Aug., 109 (Internat. Abstr.); ⁴*New Eng. Jour. Med.* 1933, March 2, 480.

TONGUE, CANCER OF. (See MOUTH AND TONGUE, CANCER OF.)

TOXICOLOGY.

G. E. Oates, M.D., M.R.C.P., D.P.H.

Radium Poisoning.—A serious hazard in luminous disc painting was first recognized in 1924. At that time the brush conveying the radio-active material was pointed with the lips of the girl workers. Shortly afterwards this harmful practice was eliminated. J. P. Leake¹ furnishes a preliminary account of the exhaustive researches carried out in the U.S.A. on the prevention of radium poisoning in industry. The use of the more dangerous mesothorium as a constituent of the paint has been discontinued. The paint is now prepared by moistening a dry powder, which consists largely of zinc sulphide, with minute amounts of radio-active salts. In order to minimize painting by hand, mechanical processes are now used in part, either transferring the paint from a die to the watch face by means of a transfer press, or dusting the dry luminous powder on dials previously painted with non-luminous adhesive. Large numbers of workers have been examined, including a special group of those exposed to serious risk prior to 1926, when precautions were first taken. The individual workers were examined for gamma radiation from their bodies, and

in most instances for the gaseous radium or mesothorium emanation in their exhaled breath. In all those examined, including the pre-1926 group, the amounts of radio-activity found, when there was a positive reading at all, were much smaller than those reported for severe and fatal cases of radium poisoning.

H. S. Martland² furnishes an account of occupational cancer due to the ingestion of radio-active materials, founded on the study of five cases of sarcoma of the bones which occurred in luminous-dial painters. He is of opinion that the development of these bone tumours and the anemias are two different stages of the same process, and are both due to a continuous bombardment by alpha particles from the radio-active material deposited in the bone. This at first produces a hyperplastic red bone-marrow due to compensatory stimulation following upon destruction. When this process subsides, a cellular replacement fibrosis of an intense inflammatory character develops, in which many of the fibroblasts show mitotic division and hyperchromatism. It is on the basis of this reaction that the sarcomas develop.

The total amount of radio-active material in the deposits necessary to produce fatal results is extremely small. Only $\frac{1}{100,000}$ gm. distributed throughout the body is sufficient to lead to the terrible sequelæ. Apart from anæmia or sarcoma, necrosis of the jaw may occur, due to infection supervening upon changes in the bone. A chronic osteitis has also been described, producing bony deformities and crippling.

The first case of death resulting from drinking radium water is reported by A. O. Gettler and C. Norris.³ In about five years the patient drank 2800 oz. of radium water containing 2800 micrograms of radio-active substances. He was emaciated on admission to hospital, and an autopsy showed that death was due to necrosis of the jaw, cerebral abscess, secondary anæmia, and terminal bronchopneumonia. There were 73.66 micrograms of radium in the body, the greatest concentration being in the vertebrae, jaw bone, teeth, femur, and ribs. (*See also PHARMACOLOGY—RADIUM.*)

Nicotine Poisoning.—H. M. Stevenson⁴ relates his experiences of acute nicotine poisoning in men who manufacture nicotine insecticidal dusts. The literature is greatly lacking in reports of nicotine poisoning by inhalation or skin absorption, by far the greater number of recorded cases having resulted from the accidental swallowing of the alkaloid or its sulphate. The symptoms of the latter form of poisoning are, firstly, nausea and vomiting, with quick, deep, and then laboured respiration; next, muscular relaxation, giddiness, mental confusion, restlessness, feeble circulation, general depression, and, occasionally, clonic convulsions. Finally there may be complete loss of reflexes and death. In the author's series of cases, which resulted from skin absorption and inhalation, the first symptoms complained of were giddiness, quickened respiration, and nausea. Intense depression followed, but vomiting did not always occur until induced by chemical or mechanical means. Difficulty of respiration was not relieved by artificial respiration, but increased regularly. No convulsions were observed, perhaps owing to the small quantity of nicotine absorbed. A very early sign of poisoning is an excessive secretion of saliva and tears and an aqueous nasal discharge.

Nicotine, however it is taken, quickly appears in the urine and is then continuously eliminated by the kidneys. If it has been swallowed and there is no free emesis, it is usual to give **Apomorphine Hydrochloride** hypodermically and to wash the stomach out with **Tannic Acid Solution**, **Strong Tea**, or a solution of **Iodine in Potassium Iodide**. In cases of poisoning by inhalation or skin absorption, these measures are not of much use, and in the author's cases vomiting was generally induced by the taking of large quantities of warm water. In every case, **Strychnine Nitrate** was administered hypodermically

with speedy relief of the symptoms. The author's cases, which resulted from the manipulation of nicotine insecticidal powders, were comparatively mild in comparison with the few which have been recorded from the breathing of air or handling of liquids having a high concentration of nicotine base.

L. P. Lockhart⁵ records a case of poisoning in a girl who, whilst making insecticide in a factory, accidentally spilt about two drachms of 95 per cent solution of nicotine on her overall sleeve. She changed the overall and washed her arm in *hot* water, dried herself, wiped her damp jumper sleeve and went on with her work. Twenty minutes later she collapsed. The recovery of the patient was partially attributed to the acumen of the nurse in the casualty room of the local hospital, who, before the diagnosis of the cause of the poisoning was established, stripped the clothing off the upper part of the patient's body and scrubbed the skin thoroughly with soap and *cold* water.

J. M. Faulkner⁶ records the case of a florist who nearly died from the effects of sitting upon a chair upon which a 40 per cent solution of nicotine had been spilled. The clothes were wetted merely over an area the size of the palm of the hand. In four days' time, after recovery, he put on the same clothes and had a serious recurrence of symptoms of poisoning.

A. D. Cowburn,⁷ a London coroner, in an inquest on a woman who died after swallowing insecticide containing nicotine, observed that the public as a whole were entirely unaware of the highly dangerous nature of this poison. Since it was frequently used by amateur gardeners it should never be sold in a concentrated form.

Carbon Tetrachloride Poisoning.—Carbon tetrachloride is used in industry as a solvent for gums, resins, and fats. It is used as a dry cleanser, and is a constituent of some of the rubber solutions. It is used, under the name of 'Pyrene', as a fire-extinguisher, and in medicine as a vermifuge in the treatment of ankylostomiasis. It is volatile at ordinary temperatures but non-inflammable. L. W. McGuire⁸ furnishes a useful summary of what is known of its toxic effects, and describes seven cases of poisoning in men engaged in the cleaning of felt, and using a 33½ per cent mixture of carbon tetrachloride. The symptoms of poisoning are firstly nausea, vomiting, and diarrhoea, accompanied by restlessness and periods of consciousness and unconsciousness, rise of temperature, and jaundice. This latter is due to fatty degeneration and necrosis of the liver cells, which is similar to that found in chloroform poisoning. The author's cases were in wine-drinkers. Carbon tetrachloride was used to remove spots from felt. This method was changed, and instead of using the pure substance to remove the individual spot, a large amount of a diluted mixture was placed in vats through which the felt was passed while the fluid was still warm. This resulted in an outbreak of poisoning. In addition to the classic symptoms, four men had evidences of kidney irritation, and one of these became critically ill with bronchopneumonia and acute nephritis. All recovered.

K. O. Møller⁹ records two cases of poisoning from hairdressing with carbon tetrachloride. In Denmark this substance is much used to cleanse a greasy hair and scalp, but the author strongly condemns this practice. He considers that bottles containing the substance should be clearly labelled, with a statement as to its poisonous properties, and warning the public not to employ it in a closed room, but as far as possible in the open.

Finally, it should be remembered that when carbon tetrachloride fire-extinguishers are used in a closed room on a hot fire, intensely poisonous gases such as phosgene (carbonyl chloride) may be liberated in toxic quantities.

Hæmaturia from a Toluidine Derivative.—Cases of hæmaturia occur from time to time among chemical workers exposed to aniline derivatives. In most cases there is a history of intimate and long working contact with

these substances, and this sign is often premonitory of commencing neoplastic change in the bladder. In such cases a cystoscopic examination almost invariably discloses (where tuberculous involvement is excluded) the presence of single or multiple papillomata in the bladder wall. Examples of sudden damage to the urinary epithelium with consequent hæmaturia are, however, rare.

A. N. Currie¹⁰ describes an outbreak of sudden hæmaturia in a factory where 5-chloro-ortho-toluidine was being purified. Contact with this substance brought in its train a distressing series of clinical events, even after elaborate precautions had been taken to guard against its effects. The bladder was chiefly affected, although the kidneys were involved to a slight extent. It produced cyanosis, strangury, frequent, urgent, and painful micturition, with hæmaturia and exfoliation of the bladder epithelium. Owing to this outbreak the manufacture of this substance was stopped. The author, after a close study of the process, is unable to say whether the poisoning resulted from the base or from its hydrochloride derivative, and whether absorption took place by the skin or by the lungs.

Lead Poisoning.—M. C. N. Jackson and L. N. Jackson¹¹ describe an outbreak of lead colic affecting some ten or a dozen men in a Devonshire town. Ten cases had the classic symptoms. In three the abdominal symptoms were so severe as to warrant the diagnosis of acute intestinal obstruction, and in one case the abdomen was actually explored. The source of this 'Devonshire colic' was cider which had absorbed lead from the conducting pipes. These pipes were 'tin-lined', but the lining of tin was apparently not thick enough to protect the lead pipes from the corrosive action of the cider. That poisoning from cider does not more often occur is possibly due to the fact that most publicans throw away the first drawn cider that has lain in the pipes all night, knowing that it is liable to be contaminated with lead. Some, however, of a more economical habit, do not waste the first drawn cider, but return it to the cask. In commenting on this outbreak the Chief Medical Officer of the Ministry of Health in his Report for 1932 deplors the practice of allowing cider and beer to come into contact with lead. Unavoidable sources of lead in foods and drinks are sufficiently numerous without being multiplied unnecessarily. Injury to health from traces of lead does not necessarily begin only with obvious symptoms of lead colic. There may be, and probably are, lesser degrees of lead poisoning, manifested only in generally impaired health and vitality, and not obviously attributable to any definite cause. Pipes properly lined with a thick coating of tin are available; and it will be discreditable alike to wholesalers and retailers if, with the knowledge and experience now available of the action of cider upon lead, they are deterred by questions of cost from taking all necessary precautions to prevent the occurrence of lead poisoning.

Consequent on certain severe cases of plumbism being admitted to Aberdeen Royal Infirmary, L. S. P. Davidson and others¹² made an investigation in the neighbourhood into the types of water-supply, the plumbo-solvency of the water, and its lead content. A clinical and hæmatological investigation was also made of a number of individuals using the local water, and a quantitative chemical investigation of their urines and fæces for lead was made. In 108 houses out of 160 sampled, the drinking-water was found to have a lead content beyond the safety limit of 0.05 parts per 100,000. Quantitative investigations for lead in the urine and fæces of 80 persons showed excessive amounts in 74 cases. Punctate basophilia was found in 33 cases out of 59 examined. Out of 102 persons examined, 51 had symptoms suggestive of mild lead poisoning, and 8 were judged to have severe poisoning.

It cannot be too strongly emphasized that the drinking-waters of many parts of Great Britain are plumbo-solvent. It would appear that various degrees of lead poisoning are by no means uncommon in these parts, and recognition of this possibility will facilitate the diagnosis and rapid amelioration of the symptoms by suitable preventive measures.

Antimony Poisoning from Enamelled Vessels.—In recent years there have been several outbreaks of antimony poisoning, fortunately not attended with fatal results, due to the use of enamelled vessels of inferior quality for the preparation of acid drinks such as lemonade. Antimony oxide, it appears,¹² is widely used, in place of tin oxide, as an opacifying agent in the enamelling of hardware on account of its comparative cheapness. The vessels in which the lemonade had been prepared in the above-mentioned outbreaks were examined, and it was found that the enamel coating had been heavily attacked and disintegrated by the acid, and the lemonade itself contained a large quantity of antimony in solution. The antimony is dissolved not only by the tartaric acid in 'lemonade crystals', but also by the natural citric acid of fresh lemons. The buckets and cans responsible for the poisoning in the cases referred to were not intended for use with foods and drinks, but the fact remains that they were so used, and there was nothing in their appearance to suggest that they were not suitable for the purpose. Now that the use of antimony in the place of tin has become common, it is advisable that the public should be warned that enamelled hollow-ware vessels obviously intended for other purposes may be dangerous if used for the preparation or storage of food or drink.

Sodium Fluoride Poisoning and Fluorosis.—T. P. Sharkey and W. M. Simpson¹⁴ call attention to the scant information contained in modern textbooks relative to the toxicology of sodium fluoride, and to the paucity of reports in medical literature on cases of poisoning. They summarize a number of papers on the subject and are able to add reports of eight recent cases in their own practice. Sodium fluoride is widely employed as an insecticide, and is the chief constituent of most roach powders. It has often been mistaken for saline laxative or baking powder, with disastrous results. In the seven non-fatal cases reported by the authors, roach powder was accidentally substituted for baking powder in the preparation of biscuits. The one fatal case resulted from roach powder being mistaken for Epsom salts.

Sodium fluoride has an acrid bitter taste and exerts a strong local irritant action on mucous membranes. The chief symptoms of poisoning from it are the sudden development of nausea and vomiting, accompanied by burning, cramp-like abdominal pains, and diarrhoea. Clonic convulsions have occurred in occasional cases. A peculiar greyish-blue cyanosis has been observed in some cases, possibly due to the formation of fluormethaemoglobin. Death is due to the direct action on the cardio-respiratory centres in the medulla. The important consideration in the treatment of sodium fluoride poisoning is the employment of calcium-containing substances in order to convert the soluble sodium salt into the insoluble calcium fluoride. This is best accomplished by copious, repeated gastric lavage with **Lime Water** or a weak solution of **Calcium Chloride**, and by the intravenous injection of calcium chloride or intramuscular injection of **Calcium Gluconate**.

Within the last ten years the serious nature of chronic fluorine poisoning has been recognized, owing to the presence of this substance in many insecticides and fumigants used in agriculture and food production. One important sign of chronic poisoning—namely, mottled teeth—is said to occur endemically in large areas of America and Southern Europe. P. F. Møller and V. Gudjonsson¹⁵ describe a new industrial risk—fluorosis of the bones and ligaments. Cryolite, a fluoride of sodium and aluminium, contains as much as

54 per cent of fluorine, together with a considerable amount of quartz. It is crushed and refined, near Copenhagen, for use in the manufacture of aluminium. Seventy-eight employees of some standing were examined. Pulmonary silicosis, almost certainly due to the quartz-laden dust, was found in half the subjects examined by radiograms. In 30 of the 78 subjects the shadows of the ribs, clavicles, and cervical vertebrae showed unusual density and abnormalities in the bone pattern. The shadows of the ribs showed uniform increase of density, and there was pronounced calcification of the costal cartilages. The bony pelvis also showed changes. No symptoms were traceable to these bony changes, but, remembering that fluorosis in animals leads to abnormal brittleness of bones, it remains to be seen whether these workers will sooner or later develop fractures. Of the 30 workers who showed bony changes, 14 were suffering from anaemia, showing a reduction in red blood-cells and total haemoglobin.

Cinchophen Poisoning.—Cinchophen is a constituent of so many widely advertised preparations that it is almost impossible for patients taking medicine for chronic pain to avoid receiving it sooner or later. It is also largely used in the treatment of gout and various kinds of chronic arthritis, owing to its ability to cause a great increase in the output of uric acid in the urine of healthy persons, and an even greater increase in those suffering from gout. T. G. Reah¹⁶ furnishes a summary of existing knowledge on the effects of this drug, and discusses a number of reported cases of toxic jaundice due to it, together with three hitherto unpublished cases. The manifestations of cinchophen poisoning are numerous. Various rashes have been described. Anorexia and gastric symptoms are readily evoked, and are followed later by jaundice, if the liver becomes involved. The liver affection may be transient, or severe, leading to death. The toxic effects do not appear to be related to the amount of the drug taken, but the author calls attention to certain accompanying conditions known to affect the liver, such as alcohol, syphilis, and pregnancy, which may have rendered the liver more susceptible to cinchophen in some of the reported cases. Apart from the recognized treatment of the liver condition by **Glucose**, the author suggests that **Calcium** may be of value, given intravenously. He deprecates the use of cinchophen as a routine measure in the treatment of gout. In severe cases where other treatment has been of no avail it may be given with caution, the patient being tested with a small initial dose.

M. W. Comfort and others¹⁷ discuss toxic cirrhosis due to cinchophen derivatives. It would appear that toxic cirrhosis of this etiology cannot be distinguished clinically from the catarrhal type of intrahepatic jaundice. The latter condition should be regarded as toxic cirrhosis until all toxic agents have been eliminated as etiological features. In cinchophen poisoning a characteristic inhibitory effect is apparently exerted on the regenerative mechanism of the liver. Clinical normality in patients who recover does not indicate complete anatomical restoration of the liver, but rather the establishment of compensation, a subclinical cirrhosis persisting and threatening the future.

There can be no doubt that if other available analgesics are effective, cinchophen products should be avoided.

Gastric Lavage in Poisoning.—H. L. Marriott,¹⁸ after considerable experience of cases of poisoning, feels that the danger of gastric lavage in comatose patients is not sufficiently realized. A stomach wash-out on an unconscious patient, whose cough reflex is absent, may be lethal. Stomach contents are always regurgitated round the tube, and must inevitably, in the absence of precautions, flow into the defenceless trachea. The result is either immediate suffocation or later bronchopneumonia. The principal precaution necessary is that the mouth and pharynx should be lower than the larynx. This is usually

achieved either by putting pillows under the shoulders and bending the head right back, or by hanging the head and shoulders over the end of the couch. Dissatisfaction with these methods led to the idea of taking the patient to the operating theatre and putting him on the operating table in the Trendelenburg position.

Resort to the theatre shows other advantages besides the tilting table. The electrical suction pump can be utilized to remove regurgitated fluid from the mouth. First-class lighting and a warm room are available, together with convenient apparatus for the administration of oxygen and carbon dioxide. An atmosphere of control and cleanliness obtains which is hard to get elsewhere.

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TRIGEMINAL NEURALGIA. (See NEURALGIA, TRIGEMINAL.)

TROPICAL TYPHUS. (See TYPHUS, TROPICAL.)

TROPICAL ULCER. (By an oversight discovered too late to be rectified this subject has been dealt with under the heading ORIENTAL SORE—q.v.)

TRYPANOSOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—H. L. Duke¹ has carried out further transmission experiments, but obtained negative results in attempting to infect one native and three volunteers with laboratory-bred *G. palpalis* cyclically infected with three different strains of polymorphic trypanosomes recovered from the wild *G. palpalis* on Damba Island, Victoria Nyanza. The same worker, in a further series of papers,² reviews our knowledge of the subject of such transmissions, and he points out that probably only a limited number of tsetse flies act as hosts for trypanosomes, and he finds that *G. morsitans* is a better carrier of polymorphic trypanosomes than is *G. palpalis*, with 6.5 per cent of the former against 2.9 per cent of the latter being found to contain flagellates when dissected, but a strain of *T. gambiense* that was found to be non-transmissible by *G. palpalis* also proved non-transmissible by *G. morsitans*. H. M. O. Lester³ also deals with this subject, and reports that a serum-sensitive strain of *T. brucei* kept in mice, and treated with repeated doses of human serum until it became serum-fast, retained that character after being passed by cyclic transmission through *G. tachinoides*, but its virulence to small animals became greatly diminished. J. F. Corson⁴ has found that guinea-pig serum and that of a resistant rat had no apparent action on two strains of *T. brucei*, although both were susceptible to normal human serum. A. F. Brown⁵ reports a case of clinical trypanosomiasis in which exhaustive examinations failed to demonstrate the parasites in the blood, but the diagnosis was confirmed by a positive red-cell adhesion test. P. D. Johnson⁶ reports a case of infection of a child in the Malay States by *T. lewisi*, and a rat taken in the child's home was heavily infected by the same parasite.

W. York, F. Murgatroyd, and F. Hawking have published the following four further studies in chemotherapy. In their eighth paper of the series⁷ they show that with an old laboratory strain of *T. rhodesiense* they could produce in mice treated by subcurative doses strains resistant to aromatic compounds

of arsenic and antimony and to acriflavine and Bayer 205, but not to tartar emetic. Resistance to Bayer 205 did not involve resistance to aromatic arsenic and antimony, and vice versa, and arsenic-resistant strains were not resistant to tartar emetic, but aromatic-antimony-resistant ones were. This indicates that aromatic antimony substances undergo some decomposition in the body. In the ninth paper⁸ they report that they failed to confirm Citron's conclusion that the resistance of a neosalvarsan-fast strain of trypanosomes can be abolished by the use of thiosulphate. In their tenth paper⁹ they show that strains of trypanosomes resistant to aromatic arsenicals are transmissible by *Glossina* and retain their characters, and in a further paper¹⁰ they proved that the resistance is maintained after passage through other laboratory animals.

The action of human serum on 64 recently isolated strains of *T. rhodesiense*, all in the first rat passage, is reported by H. Fairburn¹¹ working in Tanganyika. The majority of them were found to be resistant, but their resistance proved to vary greatly on passage from rat to rat, as it might disappear on the second passage only to reappear in later ones, so that the test should be applied to either the first rat passage or over a long series. Further, a strain cannot be said to be non-effective because no trypanosomes are visible in Yorke's technique after two to four hours, but rats must be subinoculated with it. Twenty-nine human sera, European and native, all showed the same value. The same worker¹² also reports experimental infection of man with a strain of *T. rhodesiense* susceptible to human serum *in vitro* from the ninth to the nineteenth rat passage, so the *in-vitro* technique does not indicate whether a strain has lost its infectivity for man, and the trypanolytic power of the serum is no indication of susceptibility. The action of human serums on human trypanosomes in animals is also dealt with by A. R. D. Adams¹³ working in Uganda. He found that four strains of *T. gambiense* were not susceptible to the action of normal human sera, but the serum of a case of sleeping sickness and of infected animals all showed some trypanocidal action, but passage through small animals causes a rapid decrease of the action. He also concludes that the tests of himself and Corson show that sensitiveness to human serum is not an indication of lack of ability of a strain of trypanosomes to infect man. H. L. Duke¹⁴ records inoculations of antelopes, wild pigs, and cats with recently isolated strains of *T. rhodesiense* with uniform success through the bites of cyclically infected laboratory-bred *G. palpalis* and *G. morsitans*.

TREATMENT.—The treatment of 719 cases of Rhodesian sleeping sickness with **Bayer 205** and **Tryparsamide** is reported on by G. Maclean and H. Fairburn¹⁵ in Tanganyika Territory. With 4 to 5 grm. of Bayer 205 in weekly 1-grm. doses 73.5 per cent may recover and remain well for twenty-nine months or more, provided treatment is begun within one month of the onset of symptoms, and the drug is effective in the early stages of cerebrospinal infection. Treatment at the onset of symptoms in uncomplicated cases is practically certain to result in recovery. Tryparsamide alone may also cause recovery, but it is less certain than Bayer 205 in early cases. A combination of the two drugs is of advantage in late cases, for in cachectic cases recovery may follow the combination, but does not result from Bayer 205 alone. The dose of tryparsamide should be 2 to 4 grm. in adults, with a total amount of at least 22 grm.

B. Coghan¹⁶ records his experience of prognosis and treatment in 110 cases of Rhodesian sleeping sickness. Unfavourable signs are the presence of hard fibrosed glands indicating an old case, generalized oedema, much wasting and weakness, which indicate prolonged treatment, a cerebrospinal-cell count of over 20 per cm., and the occurrence of relapse. The presence of tremor

and enlarged spleen were of little significance. The author concluded that prolonged thorough treatment with Bayer 205 and tryparsamide gave better results than short intensive courses. The injurious effect of tryparsamide on the eyes must be watched for, but 17 of 24 cases with visual affection recovered completely when the drug was withdrawn for a time, and they were subsequently able to complete their course of treatment without further trouble.

REFERENCES.—¹*Ann. Trop. Med. and Parasitol.* 1932, July 14, 191; ²*Ibid.* 1933, April 10, 99 and 123; ³*Ibid.* 1932, Dec. 16, 525; ⁴*Jour. Trop. Med. and Hyg.* 1933, Feb. 15, 53; ⁵*Trans. Roy. Soc. Trop. Med. and Hyg.* 1933, March 23, 471; ⁶*Ibid.* 467; ⁷*Ann. Trop. Med. and Parasitol.* 1932, Dec. 16, 577; ⁸*Ibid.* 587; ⁹*Ibid.* 1933, April 10, 157; ¹⁰*Ibid.* 1932, July 14, 215; ¹¹*Ibid.* 1933, July 7, 185; ¹²*Ibid.* 251; ¹³*Ibid.* 309; ¹⁴*Ibid.* 215; ¹⁵*Ibid.* 1932, July 14, 157; ¹⁶*Trans. Roy. Soc. Trop. Med. and Hyg.* 1933, June 29, 67.

TUBERCULOSIS, ANO-RECTAL. (See ANO-RECTAL TUBERCULOSIS.)

TUBERCULOSIS, AVIAN, IN MAN.

G. E. Oates, M.D., M.R.C.P., D.P.H.

S. R. Gloyne¹ summarizes modern knowledge of avian tuberculosis with special reference to infection in man. The avian strain can be readily distinguished from the bovine and human ones. There are apparently only some fourteen proved cases of avian tuberculosis occurring in man, and none has been recorded in this country. It tends to produce in man atypical tuberculous lesions, e.g., unusual skin conditions, kidney lesions, and a generalized form resembling leukaemia or lymphadenoma. It is a low-grade infection in man, and so far only two or three autopsy accounts are available. The disease occurs in both epidemic and endemic forms in fowls and is more likely to affect adult birds. Apart from workers on poultry farms, the risk of infection in man would appear to be chiefly through eggs and milk, which are liable to be used for food in an uncooked or partially cooked state. Apart from milk, the avian bacillus is found in localized lesions in cattle. The pig is also affected, but the risk from consuming beef or pork may be regarded as negligible if the meat is cooked. The author calls attention to the increasing number of unclassifiable strains of acid-fast bacilli which occur in clinical pathology. In view of the recognized possibility of avian bacillus infection in man, he suggests that such strains should be carefully investigated.

REFERENCE.—¹*Bull. of Hyg.* 1933, Jan., 39.

TUBERCULOSIS OF JOINTS. (See JOINTS, SURGERY OF.)

TUBERCULOSIS OF LARYNX. (See LARYNX, TUBERCULOUS DISEASE OF.)

TUBERCULOSIS, PULMONARY. (See also EPITUBERCULOSIS.)

J. F. Gaskell, M.A., M.D., F.R.C.P.

DIAGNOSIS.—The value of the skiagram in the diagnosis of tuberculosis of the lung is emphasized by many authors, and the point is stressed that the early stages can be substantiated with much greater certainty, so that treatment can be also earlier and more successful. The majority of the papers which have been written during the year are thus based on X-ray findings. *Continued frequent X-ray examinations* during the course of treatment have become essential for proper control. (See also X-RAY DIAGNOSIS.)

With regard to other aids in diagnosis M. Sullivan and P. H. Jones¹ have made a detailed study of the *monocyte-lymphocyte index*, using the supravital technique of Sabin. Following the experimental work of Grieger in animals, which shows that a monocyte storehouse is developed in tuberculous animals,

they have attempted to show this in a series of known and doubtful cases of tuberculosis of the lung in man by simultaneous injections of old tuberculin of 0.5 to 1.0 mgrm. intradermally, and 0.75 to 3.0 mgrm. subcutaneously. They find a marked increase of monocytes and a tendency to inversion of the monocyte-lymphocyte ratio in tuberculous cases, accompanied by a focal lung reaction demonstrable by X rays, and producible where no positive evidence of a focus had hitherto been obtained. They consider the method of great value in substantiating a doubtful diagnosis.

R. B. King² has examined the possibilities of using the *intradermal tuberculin test* in a quantitative manner in adults. He considers that a critical diagnostic dose can be found with a given tuberculin. With this as the basis of a careful technique the good results which have been obtained in orthopaedic cases can also be got in disease of the lungs and other forms. In a series of 225 cases with a wide variety of disorders, he got an accuracy of 90 per cent.

S. Lyle Cummins³ reviewed this question when opening a discussion at the centenary meeting of the British Medical Association. He still adheres to the opinion that in the adult who lives in an 'industrialized' or 'civilized' community, the test is too delicate to be of value. In children and those living in primitive conditions it is of value but not diagnostic, and the other methods now available should in the main be relied upon.

COURSE AND PATHOLOGY.—C. A. Stewart⁴ reports on the continuous study of the children at the Lymanhurst School for Tuberculous Children in Minneapolis. All positive reactors to 1 mgrm. of old tuberculin intradermally have been followed by X-ray and physical examination for periods of four to eleven years. The evolution of primary tuberculosis has thus been followed in many cases. He fully supports the view that primary tuberculosis is benign.

In the early stages it produces wedge-shaped parenchymatous lesions, which gradually recede and are followed by the production of calcified glands and Ghon tubercles. The adult type of disease, which is much more dangerous, leads to cavitation rather than calcification; it is always due to a fresh superimposed infection, never to a lighting-up of the old primary focus. The primary type of the disease is never repeated in any given case.

TREATMENT.—The value of **Surgical Methods of Treatment** which cause collapse of the diseased lung is now acknowledged among all specialists in tuberculosis, and the treatment has been in use for a sufficient length of time for the sequel to be observed and appreciated.

L. Bernard, G. Poix, and A. Bocquet⁵ record an investigation into a series of cases six to thirty years after treatment by **Artificial Pneumothorax**; 48 per cent were alive and well, 47 per cent were dead. Cured cases suffer from hardly any pulmonary disability, and are living an active life. Some retain symptoms for a considerable time, which is held to be due to mediastinal displacement, and which may amount to paroxysmal tachycardia and considerable precordial pain. Ultimately such symptoms become less and less. The condition of the lung, as shown by X-ray photographs, varies from almost complete restitution to great pleural thickening with fibrosis, thoracic collapse, and displacement of the mediastinum.

E. Mayer,⁶ discussing cavity formation, states that for early discovery skiagrams are indispensable: 50 per cent of early cavities disappear with rest alone, but if after a few weeks there is no improvement, or increase in size, collapse therapy by pneumothorax must be used without delay. The possibility of collapse depends on the condition of the surrounding lung.

M. Gross⁷ emphasizes the value of pneumothorax, and holds that it should be much more widely employed. He considers that the method should only be used in an institution, as each case must be treated on its merits, for

the rapidity of absorption, and therefore the frequency of refilling, varies greatly, also the total length of the treatment. He advocates **Phrenicectomy** at the end of the course to minimize the effects of re-expansion.

J. Gravesen,⁸ working in Denmark, has studied selectivity in collapse therapy. By careful regulation of pressure, the affected part of the lung can be left collapsed, while the rest of the lung on the same side is more or less expanded. He considers simultaneous bilateral pneumothorax of great value in certain cases, and describes a successful case of bilateral **Thoracoplasty**. Thoracoplasty should also be selective.

M. Ascoli⁹ points out that hypotensive pneumothorax frees the lung from the obligation to follow the movements of the thoracic wall, and respiratory movements and coughing then cause selective collapse of diseased lung areas. The increased pressure causes displacement of the mediastinum and a relative collapse—not expansion—of the opposite sound lung. On the diseased side the lung still expands and contracts round an altered mean pressure. The indication for bilateral pneumothorax is when the mediastinum reaches its limit of elasticity, and the contralateral effect on the opposite lung is incomplete, so that pressures are not equalized.

L. S. T. Burrell,¹⁰ reviewing treatment in the various stages of disease, emphasizes, as do many others, the value of pneumothorax in the early stages before much fibrosis is present, and also the necessity to use thoracoplasty and phrenic avulsion in cases where fibrosis has hardened the lung tissue.

R. Rautureau, A. Sailé, and A. Bohémier¹¹ have studied the after-effects of phrenicectomy and find that paralysis of the hemidiaphragm is the rule, but that this may be only temporary and disappear in about forty months. To get a lasting result 12 cm. of nerve must be resected.

A. Bernou¹² gives revised rules for the use of **Oleothonax**. The effect is mechanical merely, and a test injection should always first be given for fear of severe pleural reaction. He gives three groups in which oleothorax is indicated: (1) In cases of progressive adhesion; (2) When pulmonary collapse by pneumothorax is insufficient; (3) In certain cases of tuberculous empyema not responding to puncture and drainage. The third group is almost invariably fatal without treatment; oleothorax gives the best chance of success. D. A. Carmichael¹³ has also had good results with these three groups. Brian Taylor¹⁴ recommends gas replacement and lavage for the third group.

Gold Therapy is discussed by L. Bernard.¹⁵ It should only be used where pneumothorax alone does not apply. He gives six indications for its use; (1) Unilateral cases already treated by pneumothorax with recurrence in which a second pneumothorax does not work; (2) Pneumothorax not completely efficacious in cases with large X-ray opacity; (3) Pneumothorax treatment successful, but spread of the disease to the opposite side; (4) Disease bilateral at the beginning, pneumothorax on the worst side does not control; (5) Disease bilateral and severe—gold added to bilateral pneumothorax; (6) In place of pneumothorax—impossible or refused. He gets 50 per cent favourable results. G. Fabri¹⁶ advocates much smaller rising doses. He considers blood-counts valuable for control. A rise of red cells is favourable; a polymorph rise and eosinophilia contra-indicate gold treatment.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1933, June, 762; ²*New Eng. Jour. Med.* 1932, Nov. 10, 831; ³*Brit. Med. Jour.* 1932, ii, 1089; ⁴*Amer. Jour. Med. Sci.* 1933, March, 346; ⁵*Presse méd.* 1932, Nov. 23, 1757; ⁶*Jour. Amer. Med. Assoc.* 1933, May 13, 1478; ⁷*Munch. med. Woch.* 1932, July 8, 1122; ⁸*Lancet*, 1933, i, 354; ⁹*Presse méd.* 1932, Aug. 31, 1333; ¹⁰*Brit. Med. Jour.* 1933, April 29, 731; ¹¹*Presse méd.* 1933, July 12, 1109; ¹²*Ibid.* 1932, July 20, 1139; ¹³*Canad. Med. Assoc. Jour.* 1932, Aug., 160; ¹⁴*Proc. Roy. Soc. Med.* 1932, Sept., 1615; ¹⁵*Presse méd.* 1932, Dec. 17, 1901; ¹⁶*Policlinico (Sez. Prat.)*, 1932, Oct. 3, 1540.

TUBERCULOSIS, PULMONARY: SURGICAL TREATMENT.

A. Tudor Edwards, M.Ch., F.R.C.S.

The increasing use of surgical measures, particularly **Thoracoplasty**, in the treatment of pulmonary tuberculosis has led to the development of operations which aim at the collapse of those parts of the lung which essentially require it, with as little interference as possible with normal lung tissue. As pulmonary lesions, particularly cavities, are more common at the apex, these limited procedures largely consist of methods of apical collapse, which are locally sufficiently extensive to allow closure of quite large cavities. This has been termed by F. Johns' 'selective operative collapse', and he records a group of 33 cases treated on such lines. In these, only the upper five or at most seven ribs were resected, and with such excellent results that in 7 per cent only was there a persistent positive sputum after operation. The size and position of the cavity appears to be the governing factor in the choice of procedure, although in the majority wide resection of the 1st and 2nd ribs is required. In some cases the operation is done in more than one stage.

P. Bull,² in discussing the value of thoracoplasty for pulmonary tuberculosis, states that patients with unilateral or largely unilateral disease, in whom pneumothorax is unsatisfactory, can be cured by complete or partial thoracoplasty, alone or combined with **Pneumothorax** or **Phrenicectomy**. Patients should be submitted to a definite period of observation, and should be operated on in two stages, as this has a lower mortality than the one-stage operation. The operation is more successful in the chronic productive forms than in the purely exudative, and is indicated when sanatorium treatment of three or four months does not lead to improvement, and especially in the presence of cavities and repeated hæmoptyses. The writer states that 35 to 40 per cent of patients can be healed, and 20 per cent are benefited but die later of tuberculosis, making a total of 60 per cent who are definitely improved by the operation; 16 per cent are not improved, 6 per cent are worse, and 10 per cent die within eight weeks. In Bull's opinion no one has the right to deprive patients of the advantages of this treatment if they are suited for the operation.

Division of Adhesions during Pneumothorax Treatment.—Attempts are still being made to improve on the methods of indirect division of adhesions preventing collapse of the lung during pneumothorax therapy. This division, of course, was originally performed through two trocars and cannulae pushed into the pleura through an intercostal space under local anaesthesia. Through one cannula was introduced the thoracoscope, and through the other the cautery—originally the simple electric type, later the diathermic type. The operation is largely restricted by the size and extent of the adhesions, and if these are somewhat widespread and very short this will preclude the operation. In addition, of course, there are the risks of opening up pulmonary cavities and either in this way or otherwise causing pleural effusions, some of which are serous, others tuberculous purulent, and occasionally the latter are associated with secondary pyogenic organisms. The last condition is often eventually fatal, and even the simple tuberculous purulent collections may necessitate the cessation of pneumothorax treatment.

Hæmorrhage of a serious nature has also resulted from cauterization, and has occasionally necessitated thoracotomy for its control. N. Bethune,³ in order to avoid the risk of hæmorrhage, has devised special suture clips which can be closed upon the adhesions before division, the division being carried out by special scissors or cautery.

The large series of figures published concerning the value of cauterization suggest that in many cases the operation is performed without regard for strict indications. The real value of the procedure appears to be manifest

in those cases in which adhesions are the obvious cause of failure of cavities to collapse after pneumothorax has been carried out for some months.

The division of multiple adhesions during the early stages of pneumothorax treatment, and especially in the absence of cavitation, is unjustifiable and an unnecessarily dangerous interference.

Phrenicectomy in Pulmonary Tuberculosis.—The value of this measure in tuberculosis appears to be firmly established, both as a single measure and in association with other collapse procedures such as pneumothorax, thoracoplasty, etc.

A very valuable contribution to this subject has been made by L. Nehil and J. Alexander,⁴ who give an account of the late results in 654 patients in whom temporary or permanent paralysis had been induced for phthisis. The time interval varied from three months to six years, and of the total the ultimate fate of 612, or 95.5 per cent, is known. The essential group consists of 302 patients in which phrenicectomy was the sole operative procedure. Of 272 of this group followed up, 34 per cent are apparently cured or arrested, 12 per cent are stationary, 5 per cent are worse, and 14 per cent are dead. More than half of the cured or arrested patients had been under treatment in sanatoria for from eight to thirty-six months before operation; 215 patients had pulmonary cavities, and phrenicectomy resulted in closure of the cavities in 38 per cent. In 66 patients a unilateral phrenicectomy failed to cause satisfactory improvement, and in these further supplementary operations, such as pneumothorax, thoracoplasty, etc., were required. In 67 patients the operation was used as part of general collapsing measures, and the clinical results were largely due to the major measures.

Summing up, these authors state that in the entire series the operation fulfilled their expectation, which ranged from palliative relief to complete arrest, in 58 per cent, partly fulfilled it in 6 per cent, failed to fulfil it in 30 per cent, and the result was unknown in 5 per cent. Moreover, the operation was neither directly nor indirectly responsible for the death of any patient. They state: "As phrenic paralysis has been the principal factor responsible for arrest of the tuberculosis in 34 per cent and for improvement in 35 per cent in our patients for whom the operation was used independently, and as the only severe complication in 654 patients was marked dyspnoea in 1 patient, we are convinced that phrenic paralysis is of genuine value."

Tuberculous Empyema.—Tuberculous empyema, which is probably more common as the result of more extensive use of artificial pneumothorax treatment and the division of adhesions than it was formerly, is always a problem from the point of view of treatment. An account of the treatment of a large series of 143 patients by C. Hedblom⁵ is very valuable. This observer states that these effusions may be primary, or secondary to a pulmonary lesion, and that diagnosis is completed by the recognition of the tubercle bacillus in the effusion, and by seeing tubercles on the pleura by thoracoscopy and in some cases by biopsy.

The aim of treatment in primary cases not secondarily infected by pyogenic organisms is re-expansion of the lung, which can result by **Aspiration** of the fluid and leaving a negative pressure in the pleural cavity. Where, however, the primary lesion is pulmonary, the aim should be to obliterate the pleural cavity by multiple-stage **Thoracoplasty**. In secondarily infected cases, **Closed Drainage** associated with frequent **Pleural Irrigation** is indicated. Later, if the secondary infection can be controlled, the cavity is obliterated by thoracoplasty. Thus in his series of 143 patients, 61 were treated by aspiration, irrigation, and drainage only—22 patients in this group died; 23 further patients without secondary infection were operated upon by thoracoplasty

without mortality, and obliteration of the pleural cavity followed in 18. There were 59 cases complicated by secondary infection, and operation resulted in the obliteration of the cavity in 30, with a persisting sinus in 12 cases. In the last group the mortality was 20 per cent.

REFERENCES.—*Amer. Jour. Surg.* 1933, June, 737; *Surg. Gynecol. and Obst.* 1933, Feb., 98; *Jour. of Thor. Surg.* 1933, ii, 302; *Ibid.* 549; *Acta. Chir. Scand.* 1932, lxxi, 311.

TUBERCULOSIS, RENAL. (See KIDNEY, SURGERY OF.)

TUBERCULOUS GLANDS IN THE NECK.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The treatment of cervical tuberculosis by operative methods has been abandoned to a large extent and has been superseded by treatment in the open air and by methods of general hygiene. In the case of bones and joints results have proved the change of method to be amply justified. The same applies in large measure to the treatment of tuberculous glands. Usually, although scars may remain, the disease ultimately become quiescent. A gland may remain enlarged for a considerable time without further change. It may caseate and form a cold abscess, or the process may be cut short by calcification.

R. A. Ramsay¹ calls attention to the advantages claimed for treatment by operative removal of the infected glands, with special reference to the prevention of scarring in the natural course of events. He points out that the treatment is also much shorter, but that these theoretical advantages are difficult to realize in practice. Operative dissection must be very extensive and the incision correspondingly large. Duration of treatment is often disappointing owing to the unsatisfactory healing or recurrence in other glands.

Conservative Treatment.—Tonsils and adenoids should be removed in order to prevent the usual source of entry of infective organisms; the operation should not be premature and should be performed when the tonsils are in a quiescent state. An out-of-door life, good food, and **Cod-liver Oil and Malt** are indicated. If possible the child should be sent to a **Seaside Climate** and carefully watched. Children should be sent to school under the care of the school doctors, if possible in a suitable climate. **Sunlight** and **Ultra-violet Rays** are helpful. They should not be applied directly to the affected part but to the body in general, with a view to producing a constitutional rather than a local effect. Movements of the head and arms should be restricted. **X Rays** promote fibrosis; softening of the gland, and even slight redness of the skin, is no contra-indication to their use. Caseous material should be removed by **Aspiration**; a thick needle is required. A few drops of novocain solution are injected at the site of puncture to render the aspiration painless. The needle is introduced through healthy skin. Ramsay recommends a trocar, cannula, and obturator which fits a Record syringe. Such aspirations should be repeated at weekly intervals as long as fluid re-forms. After five or six aspirations all the caseous material that is going to soften has done so and the gland shrinks and becomes hard. Sometimes it is necessary, under gas-oxygen anæsthesia, to make a very small incision to scrape out the caseous contents.

In conclusion, Ramsay says that there is no reason why non-operative treatment should not be as universal for tuberculous glands of the neck as for bone and joint disease.

REFERENCE.—¹*Med. Press and Circ.* 1933, April, 311.

TUBERCULOUS MENINGITIS. (See MENINGITIS, TUBERCULOUS.)

TULARÆMIA.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—E. Henninger¹ remarks that though no case of tularæmia has hitherto been reported in Germany its prevalence in adjacent countries such as Russia and Scandinavia as well as in the United States indicates the likelihood of its being introduced into Germany. Warning notices have therefore recently been issued by the German Home Office drawing attention to the possibility of the introduction of tularæmia by living or dead animals, such as rabbits, hares, moles, squirrels, water rats, and sheep.

G. Olin and P. Sehlstedt² state that the first cases of tularæmia in Sweden were observed at the beginning of 1931 by Granström, of Stockholm, following the cutting up of a hare. The disease was made notifiable in Sweden in the autumn of 1931, when an epidemic of about 20 cases occurred in the course of two and a half months in the Lindesberg district. No contact with hares could be discovered, and squirrels appeared to be the only source of contagion in some cases. In others the disease appears to have been transmitted by the same insects—viz., *Chrisops discalis* and *Stomoxys calcitrans*—as in America. In other parts of the country cases were found to be undoubtedly due to contact with hares, although bacteriological examination could not be carried out in any case. Most of the cases were of the ulcero-glandular type, and there was only one example of the oculo-glandular and glandular types. In many cases the symptoms were very slight and no deaths took place.

SYMPTOMS AND COMPLICATIONS.—A case of tularæmia in which *no local lesion* developed at the site of injury is reported by E. R. Mailard.³ The patient was a pathologist who became accidentally infected with tularæmia by pricking his finger with a thumb tack while performing an autopsy on a guinea-pig which had died of experimental tularæmia. On the seventh day after the accident he developed symptoms of an infectious disease, such as malaise, headache, and fever, but no lesion developed at the site of the prick, nor was there any palpable enlargement of the regional lymph-glands. Remittent fever in which the temperature ranged from 99° to 104° lasted for three weeks. Definite agglutinations of *Bact. tularensis* in dilutions of 1-640 and 1-1280 were obtained, while agglutination tests with *Br. abortus* and *B. proteus* X19 were negative. Although such cases are exceptional, Francis has also reported examples of tularæmia among laboratory workers without any primary lesions and glandular enlargement.

Under the title of *familial tularæmia*, W. W. Waddell, jun., and C. Wills⁴ record three cases in brothers aged 11, 8, and 4 years, who developed the symptoms on the same day a week after handling a dead ground-hog. Three days before the acute symptoms appeared the children also killed and skinned a small rabbit. The writers remark that though the frequency of infection in laboratory workers has been emphasized, neither the medical profession nor the lay public yet realize the very infectious nature of tularæmia.

L. L. Tureen⁵ reports a case of *tularæmic pneumonia* in a man, aged 54, who developed the complication at an early stage of the disease, which had followed the skinning of a rabbit. The pneumonia was accompanied by serous pleurisy and myocarditis. The diagnosis was confirmed by the agglutination test. Recovery took place without specific treatment. According to Perman and MacLachlan 36 per cent of all cases of tularæmia show evidence of pulmonary involvement either clinically or at the necropsy.

DIAGNOSIS.—Olin and Sehlstedt² remark that the diagnosis was made in their cases by the agglutination test, although a positive result was not obtained until the tenth day at the earliest.

REFERENCES.—¹*Reichsgesundheitsbl.* 1932, vii, 689; ²*Bull. Off. internat. d'Hyg. publ.* 1932, Aug., 1265; ³*N. Y. State Jour. of Med.* 1933, xxxiii, 151; ⁴*Jour. of Pediat.* 1933, Feb., 187; ⁵*Jour. Amer. Med. Assoc.* 1932, xcix, 1501.

TYPHOID FEVER. (See also FOOD AND THE PUBLIC HEALTH; PARATYPHOID FEVERS.) J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to official statistics¹ the lowest typhoid death-rates per 100,000 population during the period 1931-2 were in Germany, England, Scotland, Norway, New Zealand, Holland, Sweden, and Switzerland, where the rate did not exceed 1 per 100,000. In the next group, where the death-rate varied between 1 and 2.9, were Australia, Austria, Denmark, the Irish Free State, Northern Ireland, and the Union of South Africa. Then came Belgium, France, Canada, and the United States, in which the death-rate was from 3 to 4.9. The next group consisted of Czechoslovakia, Poland, and Uruguay, with a rate between 5 and 9. The countries in which the rate was between 10 and 14.9 per 100,000 were Chili, Spain, the Straits Settlements, and Japan. In Greece, Hungary, Italy, and Portugal, the typhoid mortality still exceeds 15 per 100,000. The year 1931 was a relatively good one as regards the incidence of typhoid fever, whereas in 1932 a considerable increase occurred in many countries, especially Germany, England, the Irish Free State, France, Italy, Lithuania, Norway, Holland, Sweden, and Czechoslovakia. In extra-European countries the average mortality of recent years was considerably exceeded in the towns of Nagasaki, Alexandria, and Teheran.

The twenty-first annual report of the *Journal of the American Medical Association*² on the cities of the United States with a population of more than 100,000, of which, as in the two previous years (see MEDICAL ANNUAL, 1932, p. 559; 1933, p. 514) there were 92, shows that the total typhoid mortality is the lowest ever recorded (1.24 per 100,000 of population). Fourteen cities registered entire freedom from typhoid deaths—an unprecedented record.

In his thesis on the epidemiology of typhoid fever at Bordeaux, H. Baloux³ maintains that meteorological factors, in Bordeaux at least, do not have any direct influence on the course and severity of typhoid fever. He suggests that the undoubtedly increased incidence and fatality of the disease in the spring and autumn are due to other causes than the climate, such as the reduction in the number of inhabitants during the hot season and the return to town of large numbers at the end of summer and beginning of autumn.

H. Hunziker and R. Staehelin⁴ report an epidemic of 56 cases with 6 deaths which occurred at Basle during August and September, 1931; 25 were males and 31 females; the ages ranged from 11 to 73. The source of infection was traced to a restaurant where one of the employees handling the food was found to have a mild attack of typhoid fever. As soon as this was discovered, the restaurant was closed, and the epidemic terminated.

BACTERIOLOGY.—G. W. T. H. Fleming⁵ emphasizes the value of the liquid enrichment medium introduced by Wilson and Blair for the isolation of *B. typhosus* and *B. paratyphosus B* from sewage, as this medium may reveal these organisms when solid media give negative results. He urges that crude sewage, which in the past has often been thought harmless, should not be spread on horticultural and agricultural land, as Wilson and Blair have shown that *B. typhosus* can live for thirty-eight days in sewage.

SYMPTOMS AND COMPLICATIONS.—The first case on record of *phlebo-typhoid*, i.e., typhoid fever commencing with phlebitis, is reported by H. R. Olivier.⁶ The patient was a woman, aged 36, who was admitted to hospital with phlebitis of the right lower limb, the lower half of the thigh, leg, and foot showing a tense white œdema. The temperature was 102.4°, and there was much constitutional disturbance, but there were no enlargement of the spleen, eruption, or any abdominal symptoms. Blood culture, however, revealed the presence of *B. typhosus*, and on the eighteenth day of disease rose spots appeared, the spleen became enlarged, and the typical picture of typhoid fever developed. The

attack was severe and was complicated by intestinal hemorrhage. Subsequently phlebitis of the left internal saphenous vein occurred. Finally, recovery took place after a prolonged convalescence.

According to S. Bartsocas⁷ various estimates have been made of the frequency of relapses in typhoid fever. In adults it is relatively low, ranging from 4.5 to 10 per cent, while in children it may be as high as from 20 to 30 per cent. Relapses are as likely to follow mild as severe attacks. The interval of normal temperature between the primary attack and the relapse varies from 1 to 50 days, but the average time is 3 to 9 days. The symptoms vary. Rise of temperature is the most constant and sometimes the only symptom. The course of the fever may be identical with that of the primary attack, but usually its level is not so high, nor its duration so long. Rose spots are inconstant, appear earlier than usual, and are fewer than in the primary attack. Intestinal symptoms are usually absent, and the constitutional disturbance is less marked than before. The diazo reaction and blood cultures may be positive again. Recovery usually takes place. The duration of the relapse ranges as a rule from four to sixteen days. The relapse is usually single, but multiple relapses (two to five) have been recorded.

R. Massière⁸ regards the various tests hitherto used for determining whether the patient has become immunized, and therefore free from the risk of a relapse, as too inconstant to be of any value. He has, however, confirmed Hortopan's observations on tuberculin anergy, i.e., the disappearance of a positive cuti-reaction in the course of typhoid fever and its return in convalescence. The persistence, therefore, of a negative reaction after clinical recovery indicates that the typhoid process is still active and that a relapse may be expected, whereas reappearance of a positive reaction is valuable evidence of immunity.

A case of *typhoid ulcers of the stomach* is reported by H. Hull and L. C. Pusch,⁹ who emphasize the rarity of the condition. The patient was a man, aged 30, who died twelve days after laparotomy for intestinal perforation in typhoid fever. In addition to multiple ulcers in the lower end of the ileum the necropsy showed two ulcers, approximately 1 and 1.5 cm. in diameter, extending through the mucous membrane on the posterior surface of the greater curvature of the stomach near the pylorus. They differed from chronic gastric ulcers in the absence of granulation tissue and induration, and from acute non-specific ulcers in the absence of a predominance of polymorphonuclear infiltration and exudation.

C. Lemmet¹⁰ reports eight cases of *intestinal perforation* in typhoid fever in eight children, aged from 5 to 13 years, six of whom were boys and two girls. All underwent operation, with the result that five of the boys and both girls recovered. Lemmet comes to the following conclusions: (1) Perforation of the intestine in typhoid fever is rarer in the child than in the adult; (2) Operation should be performed as soon as the diagnosis of perforation is made; (3) The prognosis is better in the child than in the adult as the infection is less severe and the systemic resistance greater; (4) Early diagnosis and operation, which are essential for success, are facilitated by the sudden onset and obvious nature of the symptoms.

S. W. Sappington¹¹ illustrates the rarity of *mastitis* as a complication of typhoid fever by the fact that Schultze found only two examples among 2580 typhoid patients. It usually develops at the end of the disease or in convalescence. In from a third to a half of the cases it is bilateral. It is much commoner in females than in males. In 7 cases collected by Madelung in which a bacteriological examination was made, the typhoid bacillus was found in pure culture in 3, in 2 in association with staphylococci, and in 2 it was not found. Sappington reports a case in an unmarried woman, aged 22, in whom

suppurative mastitis of the left breast developed in convalescence. A pure culture of the typhoid bacillus was obtained from the pus. Recovery ensued.

R. Dupuidenus¹² has collected 26 cases of *suppuration of ovarian cysts* in women aged from 20 to 44, which in 23 was associated with *B. typhosus* and in 3 with *B. paratyphosus* B. In most cases the infection was localized in a dermoid cyst and probably took place through the blood-stream, although it may possibly also occur through the intestine. Suppuration develops in the third week of enteric fever or in convalescence, or even several months after recovery. The suppuration may assume an acute form with symptoms of peritonitis or be subacute or protracted. The diagnosis is often difficult, especially when suppuration develops at an early stage, and its symptoms are masked by those of the acute stage of typhoid fever. Blood cultures and the Widal reaction are of value in diagnosis. The prognosis after operation is good.

L. P. Gorrichon,¹³ who reports an illustrative case, states that the *association of typhoid fever and diphtheria*, which was first described by Oulmont in 1859, is usually a very serious condition owing to the complications due to typhoid or diphtheria or to acute typho-diphtheritic cachexia. In addition to the ordinary treatment for typhoid fever diphtheria antitoxin should be given in large and repeated doses. Gorrichon's patient was a woman, aged 44, who developed diphtheria in the second week of typhoid fever and died of broncho-pneumonia. There was no autopsy.

In a paper on *typhoid fever and syphilis* G. Milian¹⁴ suggests that in view of the rarity of *periostitis* in typhoid fever many, if not all, of the cases of supposed typhoid periostitis are due to *Treponema pallidum* and not to *B. typhosus*. Consequently, instead of resorting to operation, it would be better to adopt antisyphilitic treatment in such cases. Milian reports a case in a woman, aged 50, who contracted typhoid fever while under treatment for syphilis. In convalescence she developed periostitis of the occipital bone which was rapidly cured by **Potassium Iodide** and intramuscular injection of a bismuth preparation (**Bivatol**).

DIAGNOSIS.—E. Schrader¹⁵ describes three occasions on which the mistaken diagnosis of gastro-intestinal influenza was made when the real disease was typhoid fever, and on two of these occasions gave rise to an outbreak of typhoid. Practitioners therefore should hesitate in making a diagnosis of influenza in the absence of an epidemic of that disease, and would be less likely to overlook the occurrence of a case of typhoid fever if the possibility of its presence were always borne in mind.

PROGNOSIS.—P. T. Lantin¹⁶ illustrates the prognostic significance of blood cultures taken at different periods of the disease as follows: Out of 5373 cases of typhoid fever admitted to hospital, 1962 (36.52 per cent) had a single blood culture taken during the disease for diagnostic purposes only, and of these 544 (27.72 per cent) were positive. The fatality rate among the cases with a positive blood culture was 32.35 per cent, whereas it was only 13.05 per cent among those in which the cultures were negative. The prognosis, therefore, in a typhoid case with a negative blood culture is likely to be more favourable than in one with organisms in the blood-stream, especially after the first week of disease. The longer the bacilli persist in the blood, the more likely is the case to end fatally.

PROPHYLAXIS.—J. Foucault¹⁷ maintains that the duration of immunity conferred by **Anti-typhoid Inoculation** is generally fairly long, lasting at least four years. In view of the fact that there has been a considerable diminution in the incidence of typhoid fever in France since the war owing to compulsory inoculation in the army, he recommends that inoculation should be made

compulsory not only for all adults but also for children from at least 6 years of age, and that the immunity should be maintained by re-inoculations every four or five years. The following technique should be adopted. Three injections of a polyvalent heated vaccine should be given with a fortnight between each injection. The first dose for adults should consist of $\frac{3}{4}$ c.c., and the second and third of 1 c.c. each, while children should have $\frac{1}{5}$ c.c. for the first dose, $\frac{1}{2}$ c.c. for the second, and $\frac{1}{3}$ c.c. for the third. In order to avoid too many injections antityphoid inoculation should be combined with active immunization against diphtheria, equal parts of typhoid vaccine and diphtheria anatoxin being given in three doses of 1 c.c., 2 c.c., and 3 c.c. respectively, with a fortnight between each injection.

E. F. Lévy¹⁸ reviews the literature of *anti-typhoid inoculation by mouth*, and points out that most authorities are agreed that this method possesses some value, though less than that of subcutaneous injection. It appears to lessen the incidence of the disease and to render the attack milder in those who are in the incubation stage at the time of inoculation. In the absence of reliable tests it is impossible to determine the duration of the immunity, but it is probably less than that conferred by subcutaneous injection. Owing to its not causing any disagreeable local or general reaction the method is more acceptable to the civilian population than subcutaneous injection, and may be used where the latter is contra-indicated.

D. Noïca¹⁹ records three cases of encephalitis in soldiers aged from 17 to 25 which developed shortly after inoculation with T.A.B. vaccine. The issue of the cases is not mentioned. The condition was probably due to a dormant virus in the nervous system being roused into activity by the inoculation.

TREATMENT.—Further examples of the value of **Transfusion** in typhoid fever, especially in intestinal hæmorrhage, to which reference was made in the last issue (see MEDICAL ANNUAL, 1933, p. 516), are given by L. Tixier and S. de Seze,²⁰ and J. Bourgeois and A. Maislen.²¹ According to the last two writers the action of transfusion is antitoxic rather than bactericidal. The best results are obtained by selecting donors who have had an attack of moderately severe typhoid a few months previously.

G. E. Politzer²² treated 37 cases in patients aged from 9 to 53, of whom 32 had typhoid and 5 paratyphoid, by intramuscular injection every other day of **Quinine Iodo-bismuthate**. The dose was 3 c.c., and usually not more than six to eight injections were needed. In 24 out of 35 cases so treated the results were good, as shown by a more or less rapid fall of temperature and disappearance of all the other symptoms; in 10 they were doubtful and in 1 nil.

REFERENCES.—¹*Epid. Rep. Health Sect. League of Nat.* 1933, 3; ²*Jour. Amer. Med. Assoc.* 1933, c, 1491; ³*Thèse de Bordeaux*, 1931-2, No. 66; ⁴*Schweiz. med. Woch.* 1932, Sept. 17, 849; ⁵*Brit. Med. Jour.* 1933, i, 412; ⁶*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1932, xlviii, 1015; ⁷*Arch. de Méd. des Enf.* 1932, July, 377; ⁸*Gaz. des Hôp.* 1932, July 6, 1013; ⁹*Virginia Med. Monthly*, 1932, lix, 297; ¹⁰*Thèse de Paris*, 1932, No. 86; ¹¹*Amer. Jour. Med. Sci.* 1933, clxxxv, 719; ¹²*Thèse de Paris*, 1932, No. 196; ¹³*Ibid.* No. 6; ¹⁴*Paris méd.* 1933, i, 208; ¹⁵*Munch. med. Woch.* 1932, Sept. 2, 1437; ¹⁶*Amer. Jour. Med. Sci.* 1933, clxxxv, 768; ¹⁷*Thèse de Paris*, 1932, No. 201; ¹⁸*Ibid.* No. 475; ¹⁹*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1932, xlviii, 1026; ²⁰*Monde méd.* 1932, Nov. 1, 923; ²¹*Paris méd.* 1932, ii, 504; ²²*Thèse de Paris*, 1932, No. 277.

TYPHUS FEVER.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to the Epidemiological Report of the Health Section of the League of Nations,¹ a certain recrudescence of typhus took place in the countries of Eastern Europe, such as Poland, Roumania, Bulgaria, and Yugo-Slavia, during the first half of 1932, in contrast with the corresponding period of 1931. The increase, however, was most pronounced in the European

part of Soviet Russia, where nearly 40,000 cases were notified, or double the number notified during the first half of 1932. On the other hand, no increase took place in Greece, Latvia, Lithuania, or Czechoslovakia. In Africa the incidence of the disease remained practically the same, except in Egypt, where an epidemic almost exclusively confined to the Nile Delta broke out in February, 1932, reaching its height in April. From Jan. 1 to the end of the epidemic 2198 cases were notified, with a case fatality of 17.2 per cent. In Algeria there was an outbreak of 236 cases between April and July, 1932. In the Union of South Africa the disease tends to keep limited to the Cape Province, with only a few sporadic cases in the Transvaal in 1932 after the epidemic of 1931. In Asia typhus showed a remarkable spread in the Asiatic countries of Soviet Russia, where 19,250 cases were notified during the first six months of 1932 as compared with 3642 cases during the whole of 1931. The western part of Siberia and the Cossack Republic suffered most from the disease. In America typhus was most prevalent and fatal in Mexico, especially in its central part. A small outbreak also occurred in 1932 in the central and southern parts of Chile, where 183 cases were notified between March and November.

B. Coudray² states that typhus has long been present in endemic form at G ryville, a small town in the Oran district, but epidemics do not usually occur except in years of drought and famine. The disease is much milder in natives, who have probably been immunized by previous attacks, than among the Europeans.

The history, epidemiology, and mode of transmission of the *endemic typhus of the United States* are discussed by R. E. Dyer, L. F. Badger, E. T. Ceder, and W. G. Workman,³ who state that it was first described by Brill, of New York, in 1898 and again in 1910, 1911, and 1915. He at first regarded the disease, which was called by his name, as a distinct form of typhus owing to his inability to infect monkeys with it, its prevalence in the autumn, and its lack of contagiousness, but Anderson and Goldberger subsequently showed that it was immunologically identical with Mexican typhus. The epidemiological features of endemic typhus are its incidence in the summer and autumn—in contrast with the winter and spring prevalence of epidemic typhus—lack of communicability, association with food handling and rat harbours, and lack of evidence for the louse being responsible for its spread. The writers suggest that the rat flea (*Xenopsylla cheopis*) is the common vector of endemic typhus not only in the United States but also in other parts of the world, e.g., Rome and Athens, where a condition resembling Brill's disease occurs in the summer and is transmissible from man to man (see MEDICAL ANNUAL, 1928, p. 505; 1929, p. 507).

J. de Toledo, J. R. Meyer, and L. Salles⁴ describe an outbreak which occurred in the outskirts of S o Paulo, Brazil, from October, 1929, to March, 1931, during which period 61 cases were treated, with a mortality of 72.13 per cent. The disease was at first supposed to be ordinary typhus fever owing to the immigration of a large number of Russians and Slovaks, but the predominance of cases in a rural zone when the houses were separated from one another, the low incidence in the same family, the exceptional presence of lice among the patients, and the appearance of unusual symptoms and atypical microscopical features, justified the disease being regarded as a distinct entity.

TREATMENT.—Coudray² states that **Convalescent Serum**, which is very valuable as a prophylactic (see MEDICAL ANNUAL, 1929, p. 508), can also be used with advantage therapeutically.

REFERENCES.—¹*Epid. Rep. Health Sect. League of Nat.* 1932, 371; ²*Arch. Inst. Pasteur d'Alg rie*, 1932, x, 159; ³*Jour. Amer. Med. Assoc.* 1932, xcix, 795; ⁴*Typho exanthematico de S o Paulo*, 1932.

TYPHUS, TROPICAL.*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

EPIDEMIOLOGY.—In a review of this difficult subject W. Fletcher¹ described it as a group of diseases due to Rickettsia organisms carried by arthropod mites or ticks, and it differs from the louse-borne exanthematous typhus in not producing epidemics, as it does not spread from man to man. In Malaya there is an urban form resembling Brill's disease, related to rats and giving a positive Weil-Felix reaction with *B. proteus* X19, and a rural form related to mites and agglutinating with *B. proteus* K strain. G. R. Ross² reports on a form of tropical typhus met with in Southern Rhodesia, where 14 typhus-like fever cases have been met with, accompanied by a primary ulcer, and most likely the carriers are ticks or mites and so resemble the 'fièvre exanthématique' of the Marseilles district of Southern France. The main prevalence is in the summer and autumn months of December to February during the rainy season. Contact with tick-infested dogs was frequent. The macular rash usually appears on the fourth day and is widespread; the fever lasts about eleven days. Blood cultures were negative. Weil-Felix tests were done with negative results apart from occasional reactions in low dilutions only, and laboratory animal inoculations were also negative. Tick-bite fever in children in Baltimore is described by P. G. Shipley³ as occurring in rural areas in the spring and summer, with a mortality rate of nearly 20 per cent in Maryland, and guinea-pigs and rabbits are easily infected by inoculation. The blood of all the patients agglutinated *B. proteus* X19 in significant dilutions. A **Prophylactic Vaccine** has been made from ground-up ticks, and two 2-c.c. doses with five days' interval is recommended, and is said to be effective for a year in preventing mild and mitigating severe attacks.

SEROLOGY AND PATHOLOGY.—The use of the rabbit in the experimental study of the typhus group of viruses is advocated by A. Felix⁴ by inoculating them with a large dose of the patient's blood and observing them up to seven weeks, and the rabbit test is also recommended for serological tests of the different viruses with various types of *B. proteus* X. By this means the São Paulo endemic typhus was found to possess a main antigen of type X19 and a group antigen of type XK. In a further comprehensive paper⁵ the same investigator deals with the serological types of typhus virus and the corresponding types of *proteus*, which are well shown as far as they have yet been worked out in a table of the main and group agglutinins in the different varieties of typhus. Those with the main antigen virus of the OX19 type include classical typhus, Tabardillo typhus of Mexico, endemic typhus of S.E. United States or Brill's disease, 'fièvre nautique' of Toulon warships, endemic typhus of Australia, tropical typhus W type of Malaya and the Dutch East Indies, and São Paulo typhus, all except the last of which are negative to the OXK type of *proteus*. On the other hand, the K type of the Malaya and Dutch East Indies typhus, and tsutsugamashi disease of Sumatra and Malaya, and also that of Japan, are positive to the OXK but not to the OX19 *proteus*. There remains the group in which the type of the main antigen has not yet been worked out, and this includes Rocky Mountain spotted fever of the United States, 'fièvre boutonneuse' of Marseilles and Tunis, tick-bite fever of South Africa, and tick-typhus of India, in which as a class group agglutinations with the two *proteus* types already mentioned and with the OX2 type of *proteus* are obtained, but no higher main type agglutinations. Thus some sort of order is gradually being evolved by the agglutinin test in this complicated group of typhus fevers, and the writer points out that the classification proposed by J. W. D. Megaw requires to be modified in the light of these reactions. It is also pointed out that cross-immunity between typhus viruses is accompanied by identity of the serum reactions to *proteus* X, whereas failure to obtain cross-immunity

coincides with dissimilarity in agglutination reactions, and that all *proteus X* strains have been obtained from typhus cases, although their precise relationship to the Rickettsia bodies, which are believed to be the causative organisms of typhus, has not yet been fully elucidated.

REFERENCES.—¹*Brit. Med. Jour.* 1932, ii, 32; ²*Jour. Amer. Med. Assoc. S. Africa*, 1932, July 23, 453; ³*Bull. Johns Hopkins Hosp.* 1932, Aug., 83; ⁴*Trans. Roy. Soc. Trop. Med. and Hyg.* 1932, Jan. 31, 365; ⁵*Ibid.* 1933, July 28, 147.

ULCER OF THE LEG, CHRONIC. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

The work of Dickson Wright and others in the treatment of this common group of surgical cases is referred to by A. J. Cokkinis.¹ The treatment is usually ambulatory. Ointments, caustics, curetting, etc., are useless. Venous congestion and stasis should be countered by both external compression of the limb and obliteration of the stagnant varicose veins. Wright's technique is as follows: Vertical strips of **Elastoplast** are applied to the naked leg to cover the ulcer and so protect it from the edges of the circular turns of the bandage. In painful cases **Aspirin Powder** is blown on to the surface of the ulcer. The elastoplast bandage is applied evenly and as firmly as the patient can tolerate, each turn overlapping half the previous one. The bandaging starts from just behind the toes and includes the whole foot and leg up to the tubercle of the tibia. It must be very firmly applied to the lower half of the leg, though it should not be too tight at its upper two or three turns. The patient is instructed to wear a stocking over the bandage, to wash away any discharge which may soak through, and on no account to leave off the bandage without instructions. **Aspirin** and **Medinal** may be prescribed when there is much pain and loss of sleep. At the next visit, which will vary from three days to a fortnight or more (depending on the size of the ulcer), the elastoplast is removed by cutting down the front with scissors and peeling it off. A fresh bandage is then applied. The patient is encouraged to keep about and to return to work.

Sodium Morrhuate (2 c.c. of 5 per cent solution) is recommended for the injection of the veins. Two or three veins are injected at each visit except the first, when one trial injection is employed. The injections are given from above downwards, but this is not material. It is particularly necessary to obliterate the veins which can be felt in the brawny tissues near the ulcer. It is often necessary to continue the injections for months after the ulcers are healed in order to prevent recurrence. In cases of extensive varicose veins and where injections fail, ligature of the internal and external saphenous veins is strongly recommended. The former is ligatured near the saphenous opening, the latter can be tied just before it enters the popliteal space. The operation is done under local anaesthesia and, in the opinion of the reviewer, need never confine the patient to bed.

For treatment by **Skin-grafting** pieces of autogenous skin are buried under the granulations in the floor of the ulcer, but the writer thinks there is some doubt if skin-grafting materially assists the progress of the case.

REFERENCE.—¹*Lancet*, 1933, i, 1168.

ULCER, TROPICAL. (See TROPICAL ULCER.)

UNDULANT FEVER.

H. L. Tidy, M.D., F.R.C.P.

The study of undulant fever and *Brucella abortus* infections in human beings and in cattle continues to arouse great interest, and many investigations are in progress in various parts of the world. Cultures and agglutination tests with milk have revealed the surprising extent of bovine infection. An interesting

discussion on the subject took place at a joint meeting of the Sections of Medicine and Epidemiology and State Medicine of the Royal Society of Medicine in January, 1933.¹

W. Dalrymple-Champneys gave a brief account of the history (to which Fleet-Surgeon W. S. Home subsequently added the statement that the disease was unknown in Malta before the Crimean War and appeared in the island after the return of the soldiers to Malta). The modern history starts since the War. Thus in 1922 only 1 case was reported in U.S.A., the number increasing to 1545 in 1931. As to diagnosis, this could be made when there was fever of an irregular type with an agglutinating titre for organisms of the *Brucella* group of more than 1 in 100. But a case is on record in which the patient's blood serum failed to agglutinate *Brucella abortus* grown from the patient's blood. Of 115 cases in England and Wales, the organism was isolated from the blood in 7 cases of 43, from the urine in 2 cases of 24, and not in any of 5 from the faeces. Among these 115 cases there was no instance of a veterinary surgeon, butcher, or slaughterman. Professor G. S. Wilson,² however, tested the agglutinations of a series and concluded that veterinarians, slaughterers, and farm workers frequently became infected with *Brucella abortus*.

Professor Walker Hall gave the results of the examination of milk in the Bristol district. The method adopted was the determination of the presence of agglutinins to *Brucella abortus* in the milk. The following results were obtained: (1) Raw churn milk, positive for *Brucella abortus* in 26 per cent; (2) Pasteurized milk, positive in 31 per cent; (3) Graded milk, positive in 44 per cent. Inoculation into guinea-pigs showed that the pasteurized milk was always free from *Brucella abortus*, but samples of raw churn milk with positive agglutinations contained *Brucella abortus* in a high percentage.

Professor G. S. Wilson stated that latent infections were widespread in this country, but rarely caused a titre of 1-100 or over. Pasteurization properly carried out—viz., 145° to 150° F. for thirty minutes—always killed *Brucella melitensis* and *abortus*.

Detection of Undulant Fever in Routine Examination of Sera.—Emmeline Wade³ records the results obtained during the examination of 1331 sera. These were received in the Public Health Laboratory of Manchester between January, 1929, and November, 1932, from patients suffering from pyrexia, and were all sent for a Widal test, although in a few instances *abortus* infection was suspected.

Of the 1331 sera, 28 agglutinated *Brucella abortus* only, 114 gave a marked reaction with *B. typhosus*, 150 with *B. paratyphosus B*, and 1 with *B. paratyphosus A*. The sera were tested in dilutions ranging from 1 in 40 to 1 in 2560. The titres obtained in the 28 cases were: in 14 cases 1-2560, in 10 cases 1-1280, in 3 cases 1-640, and in 1 case 1-320. The antigen employed in the latter part of the period was a suspension of *Brucella abortus* supplied by the Medical Research Council Standard Laboratory, Oxford. Zonage was marked, and there was no agglutination in 1-40 dilutions, and only slight in 1-80. The remaining sera gave no agglutination with *Brucella abortus* in any dilution.

In this series agglutinations with the enteric group is nine times as frequent as agglutination with *Brucella abortus*. Calculation from the Registrar-General's statistics for 1929-32 suggests the occurrence of about 300 cases of *Brucella abortus* per annum for England and Wales. It is doubtful, however, if any reliance can be placed on this figure.

Observations in various parts of the country point to 20 to 40 per cent

of mixed milks containing living *Brucella abortus*. The low incidence of active clinical infection in human beings is surprising and suggests relative insusceptibility. Latent and subclinical infection is probably not uncommon.

The degree of zonage given in this investigation is of importance. Other investigators attach considerable weight to agglutinations in dilutions of 1-80. Latent and subclinical infections are likely to escape recognition in such circumstances.

Live Vaccines against Contagious Bovine Abortion.—It has been calculated that about 60 per cent of the milch herds of this country are infected with *Brucella abortus*.⁴ The Ministry of Agriculture issues a live vaccine designed to protect inoculated animals against abortion. The evidence that it does so has been severely criticized recently by Sir John McFadyean.⁵ Further, McFadyean points out that bacteriological investigations have proved that animals inoculated with live vaccines may continue to harbour and excrete the organisms for long periods, and consequently he considers that inoculation with living *Brucella abortus* is indefensible. The use of the vaccine was introduced at a time when little was known about carriers or human infections.

Surgical Aspects.—W. M. Simpson⁶ (America) calls attention to the surgical aspects of undulant fever as seen in Ohio. In some cases it may be confused with appendicitis and cholecystitis. The organism has a predilection for the genital tract and has relationship to certain cases of tubo-ovarian abscess, seminal vesiculitis, prostatitis, epididymitis, and orchitis. Joint manifestations are common. The author obtained favourable results with specific vaccine therapy.

DIAGNOSIS.—H. C. Yeckel and O. D. Chapman⁷ have studied the value of the intradermal test as an aid to diagnosis. They used a phenolized heat-killed bacterial emulsion. The results were identical with *abortus* and *melitensis* antigens. The optimum time to read the result was ninety-six hours after injection. A series of 250 patients were examined: 14 (5.6 per cent) were read as positive, and of these there was only one case which did not show a possible undulant fever history or source of infection; 8 (3.2 per cent) were read as pseudo-positives, and 228 (91.2 per cent) as negatives, and apparently in these there was no reason to suspect an infection of undulant fever. The test is harmless and does not disturb the patient. It may be positive and lead to a definite diagnosis in the presence of a negative agglutination reaction. Negative agglutination and intradermal reactions exclude clinical undulant fever. The skin, however, remains sensitive to the specific antigen long after the active infection.

TREATMENT.—J. Widal⁸ has used **Neoarsenobenzol** in 7 cases, with favourable results in 6 instances. He recommends an initial dose of 0.3 gm. increasing to 0.45 gm. Two injections are given weekly, the average total dose employed being from 2.5 to 3.5 gm. An injection is commonly followed by a sudden drop in temperature, but treatment must be continued until apyrexia is stable. Definite recovery usually occurs within one to three weeks of the first injection.

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1933, xxv, 1093; ²*Vet. Record*, 1932, n.s. xii, 1240; ³*Lancet*, 1933, i, 1342; ⁴*Ibid.* 974; ⁵*Jour. Comp. Pathol. and Therap.* 1933, March, 50; ⁶*Southern Surgeon*, 1932, i, 184; ⁷*Jour. Amer. Med. Assoc.* 1933, c, 1855; ⁸*Paris méd.* 1933, i, 223.

URÆMIA. (See APOPLEXY, CEREBRAL—HYPERTENSIVE CEREBRAL ATTACKS; RENAL DISEASES.)

URETER, SURGERY OF.*Hamilton Bailey, F.R.C.S.*

Stone in the Ureter.—The antispasmodic value of *Amми Visnaga** was noticed clinically by A. P. Ibrahim in 1929. K. Samaan¹ has found this drug effective in aiding the passage of ureteric calculi. It is superior to papaverine or atropine in relieving spasm of the ureter. The dosage recommended is as follows: 30 c.c. of a warm 1-40 decoction of ammi visnaga together with 5 c.c. of 1-10 tincture of the drug is given as one dose. Three doses, and occasionally four, are given each day.

Excretion pyelography has been a great aid in the diagnosis of ureteral calculi. If the medium is eliminated equally well from both kidneys, at least one knows that there is no ureteral obstruction. M. Wesson and C. C. Fulmer² do not find excretion pyelography of any value in locating a non-opaque calculus. In those isolated cases of stones which do not cast an X-ray shadow the diagnosis is exceedingly difficult. For the diagnosis of transradiant ureteral stones J. A. Jenkins³ emphasizes the value of the ureteric catheter tipped with wax; when the catheter is withdrawn, if a stone is present, the wax will be found to be scored.

C. P. Mathé⁴ advises early **Uretero-lithotomy** in the following circumstances: (1) Impacted calculi; (2) Stones showing no tendency to descend; (3) Calculi in the solitary or bifid ureter; (4) When it is impossible to make repeated cystoscopic treatments. J. A. Jenkins states that cystoscopic manipulations are justified when the urine is not infected, but operation should be resorted to early when infection is present.

A. M. Crance⁵ has found the following manipulation very successful in dislodging moderate-sized ureteric calculi. A ureteric catheter is left in 24, 48, or 72 hours. As it is about to be withdrawn, sterile water is injected up the catheter until the renal pelvis is dilated slightly beyond the point where the patient feels renal pressure. The catheter is then withdrawn. These two forces acting simultaneously in many instances accomplish their desired purpose.

B. F. Fillis⁶ describes the ureteric bougie made of sea tangle. It is claimed that with this instrument any part of the ureter may be dilated safely.

Multiple Ureters.—A patient with four ureters is reported by O. Addison.⁷ By excretion pyelography a girl aged 9 was found to have a renal pelvis and two separate ureters on each side. Urine collected from each of the four ureters was shown to be heavily infected with *B. coli*. Other cases of patients with four ureters are reported by P. Williams⁸ and by H. Alstraldi and F. Martinez⁹; the latter authors point out how easily a double ureter is demonstrable by excretion pyelography.

The Treatment of Pyelitis of Pregnancy.—The majority of cases of pyelitis of pregnancy respond to medicinal treatment. G. S. Foulds¹⁰ recommends that a glass of **Fluid** be taken every half hour during the day and every hour during the night while awake. **Alkalis** are administered freely until the urine is thoroughly alkaline as tested by litmus. When the symptoms have abated, in about a week or ten days one may switch over to **Hexamine** and a urinary acidifier, of which **Ammonium Chloride** is best. When the treatment fails, treatment by urological measures must be invoked. **Ureteral Catheterization and Lavage of the Kidney Pelvis** is ideal treatment. Foulds leaves the catheter in place forty-eight hours if possible, and keeps washing out the pelvis with normal saline. Only very occasionally does he employ antiseptics, and then 1-3000 **Acriflavine**. If these measures are adopted in time, Foulds is convinced that it should be necessary only on the

* Tinct. Ammi Visnaga may be obtained from The British Drug Houses Ltd., Graham Street, City Road, London, N.1.

rarest occasion to empty the uterus because of persistent pyelitis of pregnancy. (See also URINARY ANTISEPTICS.)

Injuries to the Ureter during Hysterectomy.—Injury to a ureter during the course of a difficult hysterectomy is not a rare accident. G. Vincent¹¹ describes various forms of the lesion. The ureter may be sectioned transversely or obliquely, or a piece may be removed from its side wall; it is sometimes occluded by a ligature, or ligation in its immediate neighbourhood can cause an obstructive kink. Finally, especially after cautery operations for carcinoma of the cervix, necrosis followed by a urinary fistula results. The site of the lesion is usually in the broad ligament near the uterine artery, but it sometimes occurs higher up in the region of the suspensory ligament of the ovary. The injury may be (1) recognized at the time of the injury, (2) during the immediate post-operative period, or (3) later. We shall refer here to the types (1) and (2).

R. V. Day¹² says anuria after hysterectomy usually means ligation of both ureters. In such cases he advises immediate bilateral **Nephrostomy**. To attempt to explore the pelvis where structures are œdematous and matted, combined with an uncertainty of finding the occluded ureter, is to court disaster. Nephrostomy is a certain method; when the patient is out of immediate danger is time enough to attend to the actual lesion. This author describes the case of a woman of 28 whom he saw four days after an operation for hysterectomy. She had passed no urine since the operation, and the bladder was empty. Day performed bilateral nephrostomy. Two months later the left ureter was transplanted into the bladder. It was found that the right ureter had been sectioned too high for anastomosis with the bladder, so nephrectomy was performed on that side. The patient made a good recovery.

Day refers to a case of Caulk's: Both ureters had been ligated in the course of a hysterectomy. Caulk performed bilateral nephrostomy eight days after hysterectomy. On the fifty-eighth day both nephrostomy wounds closed, the urine coming normally from both kidneys. Five years later the patient was seen, and had been perfectly well in the interval. There can be little doubt that the correct immediate treatment in such cases is nephrostomy. [Injuries to the ureters during hysterectomy could largely be prevented if as a preliminary to the operation ureteric catheters were passed and left in place.—H. B.]

Urinary fistula following accidental wounding of the ureter during hysterectomy are usually external; the leak occurs through the abdominal wound or through the vagina. G. L. Hunner and H. S. Everett¹³ refer to *urinary ascites*. Although the peritoneal cavity became filled with urine for more than a week the patient was not gravely ill. She was treated satisfactorily by implanting the proximal end of the cut ureter into the bladder, and she has remained well.

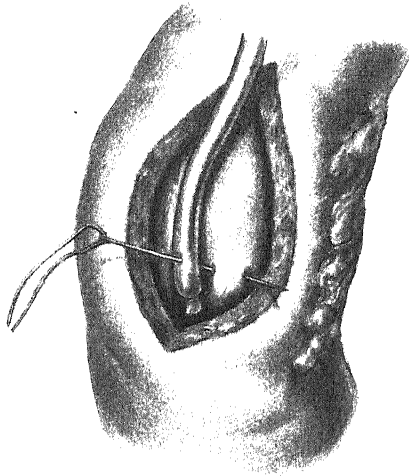
For the treatment of urinary fistula following damage to the ureter during hysterectomy no definite rules can be laid down; each case must be treated on its merits. If the ureter can be proved to be severed completely, **Implanta-**

Proximal End into the Bladder should be attempted. In other operation into the bowel offers an alternative to nephrectomy. E. W. that, when it is possible, undoubtedly the best reparative measure of the ureter into the bladder. Anastomosis of the cut ends is seldom satisfactory—even ideal ureteral anastomosis often segmental atony or stricture with superimposed infection. Deep X rays has been tried with a view to sclerosing the kidney side and thus drying up the leak. Judging by reports of McKern's¹⁵ patients in which deep X rays were tried the method

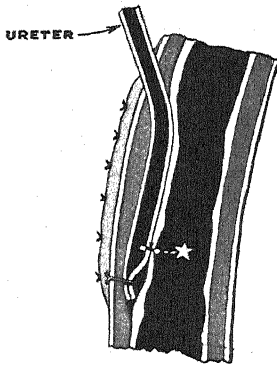
PLATE LV

IMPLANTATION OF URETERS INTO BOWEL

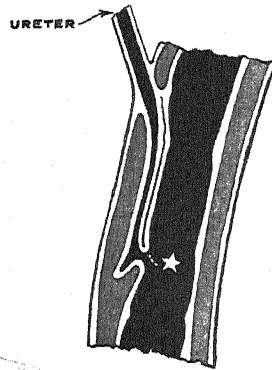
(R. C. COFFEY)



A



B



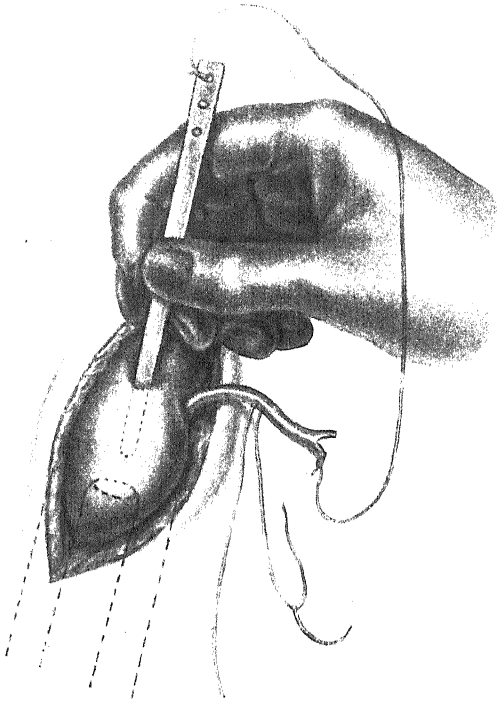
C

Coffey's "Technic 3" for implanting the ureter into the bowel. (See text.)

PLATE LVI

IMPLANTATION OF URETERS INTO BOWEL—*continued*

(P. N. WALKER-TAYLOR)

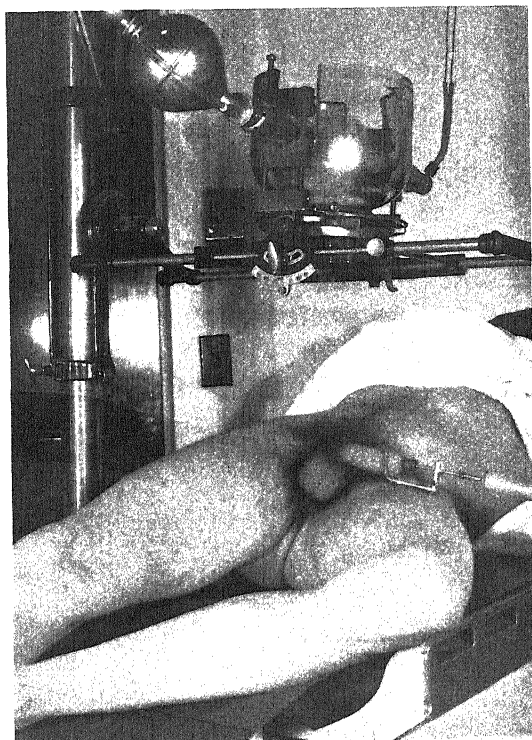


Walker-Taylor's 'harpoon' method of implanting the ureter.

PLATE LVII

URETHROGRAPHY

M. A. NICHOLSON AND M. J. FIALA



Showing the position of the patient upon the X-ray table.

By kind permission of the Journal of Urology

Implantation of the Ureters into the Bowel.—Much attention is still being directed to perfecting the operation of implantation of the ureters into the bowel (C. A. R. Nitch¹⁶). R. C. Coffey,¹⁷ whose name has been closely associated with the evolution of uretero-intestinal anastomosis, presents his third method for its performance—"Technic 3" he calls it. The operation is carried out in two stages, one ureter being implanted at a time. The principle of the method is illustrated in *Plate LV*. The end of the ureter is ligated. A double strand of silk, penetrating the mucosa of the bowel and the ureter, is tied tightly. This cuts through in forty-eight hours to three days, completing an anastomosis between the lumina of the ureter and the colon. Coffey has shown by animal experiments that this is the safest of all methods, and he states that because of its simplicity it seems destined to assume an important rôle.

P. N. Walker-Taylor¹⁸ suggests implanting the ureters by means of a 'harpoon'. The method will be rendered clear without description by reference to *Plate LVI*.

REFERENCES.—¹*Brit. Jour. Urol.* 1933, Sept.; ²*Amer. Jour. Roentgenol.* 1932, July; ³*Austral. and N. Z. Jour. Surg.* 1932, July, 21; ⁴*Jour. of Urol.* 1932, Aug.; ⁵*Amer. Jour. Surg.* 1933, Jan.; ⁶*Jour. of Urol.* 1932, Jan., 117; ⁷*Brit. Med. Jour.* 1932, ii, 1008; ⁸*Jour. of Urol.* 1933, Sept., 271; ⁹*Arch. des Mal. des Reins et des Org. gen.-urin.* 1933, vii, 361; ¹⁰*Canad. Med. Assoc. Jour.* 1933, Feb., 172; ¹¹*Arch. des Mal. des Reins et des Org. gen.-urin.* 1932, vi, 607; ¹²*Jour. Amer. Med. Assoc.* 1932, Dec. 3, 1942; ¹³*Jour. of Urol.* 1932, Sept., 333; ¹⁴*Ibid.* July, 36; ¹⁵*Zentrabl. f. Gynäkol.* 1931, Oct., 3; ¹⁶*Proc. Roy. Soc. Med.* 1932, July, 1413; ¹⁷*Jour. Amer. Med. Assoc.* 1932, Oct. 15, 1320; ¹⁸*Austral. and N. Z. Jour. Surg.* 1931, i, 158.

URETHRA, SURGERY OF.

Hamilton Bailey, F.R.C.S.

Urethrography.—Visualization of the male urethra is a diagnostic asset in many cases of stricture, diverticulum, and other diseases of the urethra. It is also an invaluable method of investigating the cause of unsatisfactory results after prostatectomy (E. G. Crabtree and M. L. Brodneyn¹). M. A. Nicholson and M. J. Fiala² have improved the technique of urethrography, and, judging by the urethrograms produced in their paper, urethrography has now reached a pinnacle of perfection. The position of the patient upon the X-ray table is important and *Plate LVII* shows this clearly. A valuable and almost necessary piece of apparatus is the penile clamp devised by Knutsson, of Stockholm (*Fig. 99*). Heavy lipiodol diluted one-half with oil of sesame is employed for the injection. The oily mixture is injected at body temperature with a 25-c.c. syringe, which is ample for almost all cases. When there is spasm of the compressor urethræ the patient is asked to make a slight effort at urination, and with a moderate increase of pressure the fluid passes through the posterior urethra.

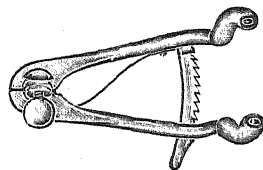


Fig. 99.—Knutsson's clamp for use in urethrography. The rubber-covered arms encircle the glans while lipiodol is injected. The clamp is then tightened, which prevents the opaque medium from running out while the radiograph is being taken.

Rupture of the Urethra.—For complete intrapelvic rupture of the urethra J. H. Powers³ opens the bladder suprapubically. He then threads a catheter down the whole length of the urethra. The tip of the catheter is made to protrude through the suprapubic wound. It is kept there by attaching the tip to a wooden spatula by means of silkworm gut sutures. The tongue depressor lies on the abdominal wall just above the pubis. The bladder is drained by aspiration through a de Pezzer's catheter. During the later stages of treatment in one case there was difficulty in passing a bougie. Powers

introduced a cystoscope into the suprapubic wound, and by this means was enabled to pass a ureteral catheter through the internal meatus and thence along the whole urethra. Furthermore, he finds that suprapubic cystoscopy is valuable in determining the effectiveness of subsequent dilatations of the urethra. By looking into the bladder from above while passing a sound from below, it is possible to see if the tip of the instrument emerges through the internal meatus.

For that depressing aftermath of complete intrapelvic rupture of the urethra which is seen too often, and which is largely preventable by correct treatment at the time of the accident—we refer to a young boy with an impermeable stricture and a suprapubic fistula—there is now an effective line of treatment. On such a case C. Haines⁴ in 1926 performed Coffey's operation of ureteral transplantation. The patient has remained well, and has perfect rectal control of urine.

REFERENCES.—¹*Jour. of Urol.* 1933, March, 235; ²*Ibid.* 460 ³*N. Y. State Jour Med.* 1932, Oct. 5, 1188 ⁴*Jour. of Urol.* 1933, March, 285.

URETHRAL CARUNCLE. *Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.*

Local tenderness and soreness on micturition in middle-aged and elderly women are often associated with the presence at the urethral orifice of a so-called 'caruncle'. This term is commonly applied to a localized overgrowth of mucous membrane situated usually on the floor of the canal in close relationship to the orifice of 'Skene's ducts' or glands. The majority of local caruncles take on the character of a granuloma, and some are extremely vascular and may almost be regarded as telangiectatic papillary or mucoid polypi. The etiology of these small vascular granulomata is probably intimately bound up with a coexisting chronic inflammation of the urethral and para-urethral glands. Certainly in many cases it is possible to express a purulent or mucopurulent secretion from the ducts of these glands, if the urethra is 'milked' from behind forwards. It is well known, of course, that these small bright-red vascular polyps are highly sensitive on contact, but care must be taken not to label as a caruncle any tender everted mucosa or overgrowth which presents unusual sensibility. Many small local lesions at the urethral orifice are wrongly termed 'caruncles', and mistakes are commonly made in the case of *local eversion*s of the urethral mucosa which have become congested and chronically inflamed. A protruding portion of urethral mucosa, although not usually tender, may be extremely sensitive, and under such circumstances may be readily confused with a true caruncle. The position of the urethral orifice in relation to the local projection should suffice to prevent mistakes of this kind.

TREATMENT.—The treatment of a urethral caruncle is either excision or radiation. The technique of **Excision** has recently been described by P. A. Ferrier,¹ who stresses the importance of *excising the whole of the basement membrane* from which the caruncle arises. After removal the base is cauterized with a small electric cautery such as is used in the nose. The author cautions against the use of deep fulguration or deep cautery owing to the risk of producing subsequent stricture.

The treatment of urethral caruncle by **Radium** is advocated by R. E. Loucks². He employs a 25-mgrm. tube protected by 0.5 mm. silver and a 1-mm. brass tube enclosed in rubber 1.5 mm. in thickness. The radium tube is kept in position for five or six hours by means of three dummy tubes, one being placed in each para-urethral fossa and the third passed along the anterior wall of the vagina. The vaginal 'dummy' tube is fixed to the three anterior tubes by means of guttapercha. The urethra is subsequently irrigated twice daily and the urine rendered alkaline by appropriate medication. [The

author is enthusiastic with regard to the results of radium therapy in the case of urethral caruncle, but the method appears to us to be cumbersome and unattractive in face of the excellent results which are associated with the little operation.—B.W.]

REFERENCES.—¹*Amer. Jour. Surg.*, 1930, viii, 403; ²*Amer. Jour. Roentgenol.* 1929, xxi, 537.

URINARY ANTISEPTICS. (See also PHARMACOLOGY AND THERAPEUTICS.)

Hamilton Bailey, F.R.C.S.

There are a bewildering variety of urinary antiseptics on the market. At a discussion on the relative merits of these drugs certain American urologists¹ expressed scepticism as to the value of any of them, several of the speakers stating that the best urinary antiseptic was water and plenty of it! The following drugs have been proved, to the satisfaction of the investigators concerned, to be valueless: caprokol and methenamine (E. Davis and J. C. Sharpe¹), hexylresorcinol, pyridium, and helmitol (Mitchell and Scott).

Sodium Acid Phosphate: its Failure as an Acidifier of the Urine.—Every practitioner will have met with cases of alkaline cystitis where prolonged and liberal doses of sodium acid phosphate have failed miserably to alter the reaction of the urine. The shortcomings of this well-tried drug led D. R. Mitchell and J. M. Scott,² who have been closely investigating urinary acidifiers, to try acid ammonium phosphate experimentally and clinically. They are satisfied that both acid ammonium phosphate and ammonium chloride are superior as acidifiers of the urine to sodium acid phosphate. They recommend the following prescription.

R	Acid Ammon. Phos.	gr. xx
	Syr. Limonis	℥ss
	Aq. ad	℥ij
	t.d.s. p.c.	

There are at least a few urinary antiseptics which experimentally and clinically appear to fulfil their mission.

Neotropin.—At a meeting of the Berlin Urological Society³ many speakers referred enthusiastically to neotropin as a urinary antiseptic. The usual dose of neotropin is two dragees by mouth, with copious draughts of barley water. H. Lett⁴ writes: "I have had more success with neotropin than with others, but it must be given with caution and the dose increased slowly, omitting the drug for two days out of every seven. In one patient it caused troublesome diarrhoea". Neotropin is equally effective whether the urine be acid or alkaline.

Hexamine.—

Hexamine by Mouth.—This has stood the test of time, and in a well-acidified urine D. R. Mitchell and J. M. Scott² state that it cures one-third of all cases of pyelitis and cystitis, *providing that there is no underlying surgical lesion*. When this drug is administered they recommend that it should be given, not with acid sodium phosphate (*see above*), but with ammonium chloride in the following mixture:—

R	Ammon. Chloride	gr. xx
	Hexamine	gr. x
	Liquid Ext. of Liquorice	℥℥ xxv
	Aq. ad	℥ij

Not only is ammonium chloride a better acidifier than sodium acid phosphate, but it possesses another great advantage—a mixture containing ammonium chloride and hexamine remains stable for more than two weeks, whereas, as is well known, when sodium acid phosphate is used the hexamine must be prescribed separately.

Intravenous Hexamine.—H. Bailey⁵ has found intravenous urotropine (Schering) exceedingly effective in the acute stages of pyelitis; 5 c.c. of the 40 per cent solution are injected daily or twice daily until the temperature falls.

Acriflavine.—Providing the urine is alkaline (and in an alkaline urine only) E. Davis and J. C. Sharpe¹ have proved that acriflavine exerts an antiseptic action against the colon bacillus and the staphylococcus. Acriflavine is administered in doses of 0.2 grm. in capsules.

Referring to the alkalization of the urine there appears to be general agreement that potassium citrate is satisfactory. G. S. Simpson⁶ says, "I am convinced as to the value of alkalis during the acute stage of pyelitis". He recommends 2 drachms of potassium citrate every two hours until the urine becomes alkaline, and the only way of telling this is to test the urine with litmus.

Ketogenic Diet.—The treatment of intractable urinary infections by the use of a ketogenic diet has received considerable attention this year. The production of ketonuria of a pH of 5.5 renders the urine highly bactericidal.

A. L. Clarke⁷ describes fully, with the diet sheet, the technique of the treatment. D. M. Dunlop⁸ explains that the ketogenic diet contains a minimum of carbohydrate, a small quantity of protein, and the maximal quantity of fat. A normal diet contains about 300 grm. of carbohydrate. This amount has to be reduced to about 15 to 30 grm. before adequate ketosis is produced. D. Band⁹ states that the ketogenic diet proved satisfactory when it was tried at Edinburgh Royal Infirmary upon a series of cases of intractable chronic pyelitis. In another series of 11 cases of very chronic urinary infection treated by the ketogenic diet by D. M. Dunlop, 5 were apparently cured, and 1 benefited considerably. (See also PYELOCYSTITIS; PYURIA IN CHILDREN.)

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1932, Dec. 17, 2097; ²*Brit. Jour. Urol.* 1933, Sept., 225; ³Meeting of Berlin Urological Society, 1931, Oct.; ⁴*Clinical Jour.* 1932, Dec., 592; ⁵*Practitioner*, 1933, March, 342; ⁶*Medical Forum*, 1933, i, May; ⁷*Lancet*, 1932, ii, 511; ⁸*Proc. Roy. Soc. Med.* 1933, Jan., 217; ⁹*Ibid.*, 217; Helmholtz, H. F., *Jour. Amer. Med. Assoc.* 1932, Oct. 15, 1306.

URINARY TRACT SURGERY IN CHILDREN.

John Fraser, Ch.M., F.R.C.S.Ed.

H. P. Winsbury-White¹ gives an interesting review of the present position of urinary tract surgery in the child. He covers a wide field and quotes cases illustrative of the various conditions under discussion. He recalls the often overlooked fact that painful and frequent micturition in a male baby may proceed from a small *meatal ulcer*, and he reminds us that a similar state of affairs may result in the female from a vulvo-vaginitis. He stresses the importance in female children of examining the external genitals and particularly the cervix uteri, and of investigating the bacteriology of the part. He recommends that the examination be carried out by fitting a special tube to an anterior urethroscope. Winsbury-White is particularly interesting on the question of *stone*. He recalls that the disease is less common than formerly, and he attributes the decreasing incidence to improvement in conditions of feeding and of general hygiene. He quotes McCarrison's experiments in this connection, the summary of which is that when whole-wheat flour or oatmeal composes the major part of an unbalanced diet stone formation is apt to result.

When the error of *hypospadias* arises Winsbury-White employs a special modification of Bucknell's operation, transplanting the foreskin on to the front of the scrotum, so that its mucous membrane surface is superficial. This tissue is subsequently employed in the formation of the deficient urethra.

Intravenous urography has come to be accepted as a safe and valuable method of investigating renal, urethral, and even bladder errors, and it is

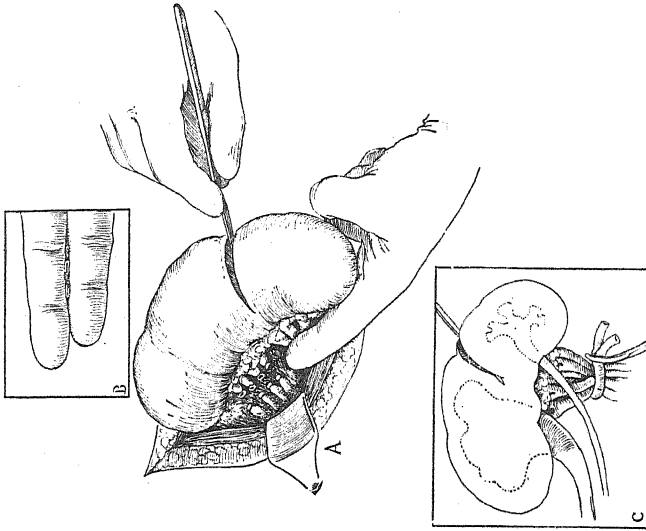


Fig. 101.—Technique of pedicle compression in renal resection.
A and B, With fingers; C, With tourniquet.

(Figs. 100, 101 by kind permission of the 'American Journal of Surgery'.)

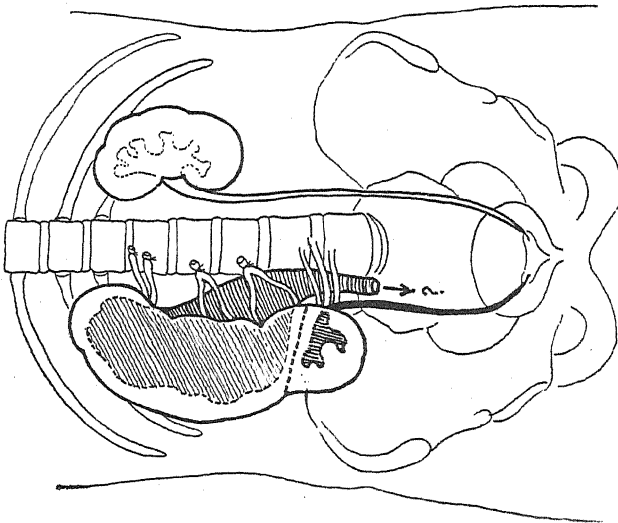


Fig. 100.—Hemipyelonephrosis. Schema of pathological anatomy.
Termination of diseased ureter from resected left upper pole was
never determined, either with or without chemo-cystoscopy.

evident that for technical reasons it is particularly valuable in children. F. F. Schwenker² describes his experience in a series of 56 cases. **Iopax** (30 per cent) was the substance used. In children over two years of age no special preparation was followed, but in younger children it was found important to ensure the evacuation of gas from the intestine by administering **Pituitrin** thirty minutes before the injection, following this by abdominal massage for ten minutes. The dosage is estimated in a ratio of 33 c.c. of the 30 per cent solution for each kilo of body weight, and it is recommended that five to ten minutes should be occupied in the injection. The dosage is three times greater than that employed in the adult, but the author states that this concentration is necessary if good visualization is to be obtained. In no case did toxic symptoms develop. X-ray examination was made at intervals of fifteen, forty-five, and ninety minutes after the injection, and no fluids were allowed until after the forty-five minutes had passed.

Discussing the matter of results, the author says that in children below the age of two years the results are not very satisfactory, about 35 per cent only being sufficiently definite to be of use in diagnosis. The proportion of good results in older children is better, being about 65 per cent. The reasons advanced in explanation of the poor results in small children are restlessness during the X-ray investigation, the presence of intestinal gas, and the small bore of the ureter. The final conclusion is that, in view of the simplicity of the intravenous method, it has a definite place in the urological work of childhood, but the results which it shows are probably not so constant, so readable, or so reliable as those obtained by the retrograde method.

Hemipyonephrosis (a pyonephrosis of half a reduplicated or double kidney) is reported by M. F. Campbell³ as being a more frequent occurrence than is generally recognized. He believes, however, that the condition is rarely diagnosed. He reports four cases, all except one (a girl of 5 years) being less than 2½ years old. All were subjected to examination because of so-called chronic pyelitis. In three instances a uretero-heminephrectomy was successfully performed; in the remaining two cases it was necessary to carry out a nephrectomy (Figs. 100, 101).

The record is of interest for two reasons: it illustrates the importance of a detailed urological examination in any persistent case of pyelitis, and it demonstrates the possibility of eliminating the infected segment without sacrificing the entire kidney tissue on the diseased side.

REFERENCES.—¹*Lancet*, 1932, ii, 1317; ²*Bull. Johns Hopkins Hosp.* 1932, Nov., 318; ³*Amer. Jour. Surg.* 1933, July, 85.

UTERUS, FIBROIDS (FIBROMYOMATA) OF.

Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.

Twenty per cent of all women over the age of 35 years have been shown by autopsy to possess fibroid tumours in their uterus. In the case of negroes this figure has very considerably to be augmented. Many of these patients suffer not the slightest inconvenience from the presence of these neoplasms, and quite often are entirely without knowledge of their existence. Since the modern treatment of uterine fibroids is either surgical, radiological, or expectant, it is a matter of considerable importance to decide into which category a given case falls when a fibromyomatous uterus is discovered, possibly by chance. The problem is well discussed by the late William P. Graves in the article contributed by him to the new work on obstetrics and gynaecology edited by Arthur H. Curtis.¹

Whilst it is unnecessary to treat every fibroid that one encounters, the author observes that only *the symptomless tumour* should receive expectant

treatment. This, however, must not be misconstrued to indicate that all symptomless cases should necessarily be left alone. Some of the most dangerous tumours are entirely without symptoms. The second cardinal rule which Graves enumerates is that only *small tumours* should be treated expectantly. In this connection the size of the tumour must naturally be considered in relation with its position in the uterus. A tumour of comparatively small size situated in the lower uterine segment has infinitely greater potentialities of danger than a growth of similar dimensions situated at the uterine fundus, and therefore calls for earlier removal even in the absence of symptoms. Graves' third rule is that from the late thirties small subperitoneal and interstitial fibroids do not in the majority of cases increase to a dangerous size. On the other hand, during the late twenties and early thirties these tumours tend to grow quite rapidly, and if expectant treatment is adopted it is necessary to keep a very careful watch over the situation. A few months' neglect at these ages may make all the difference between myomectomy and hysterectomy.

Large symptomless tumours should only be treated expectantly in the presence of some constitutional contra-indication to surgical interference. Sooner or later these large neoplasms are almost certain to cause trouble, and, as Graves very truly says, after the menopause as well as before it. "The expectant treatment of large fibroids—'waiting for the change of life'—is illogical, and some of the most tragic events of old age occur in myomatous women who waited for the false benefits of the climacteric."

The surgical treatment of myomata is radical, and includes **Hysterectomy**, either total or subtotal, and **Myomectomy**. The advantages of myomectomy over hysterectomy and total over subtotal hysterectomy have been discussed in recent issues of the MEDICAL ANNUAL, and it is unnecessary again to emphasize the views there expressed. After the menopause abdominal myomectomy is very rarely required, except perhaps in the case of a pedunculated subserous tumour which has given rise to symptoms.

Degenerating submucous tumours are best removed by **Vaginal Myomectomy**. Such neoplasms are commonly the seat of a streptococcal infection, and if laparotomy is performed there is a grave risk of infecting the general peritoneum.

Radiation, preferably with radium, is an extremely useful therapeutic measure during the fifth decade in the case of small fibromyomatous tumours associated with severe uterine bleeding. The hæmorrhage is usually menorrhagic in type, and can be controlled effectively if a sufficiently large dose of intra-uterine radium is employed (at least 50 mgrm. Ra El. for 72 hours). Although deep Roentgen-ray therapy may be successful in controlling dangerous bleeding from the uterus in a case suitable for radiation, radium possesses certain advantages over the former. The most important is the opportunity afforded to conduct a thorough examination of the pelvic organs under anaesthesia, including biopsy of the endometrium and cervix—precautions which are commonly neglected with Roentgen-ray therapy. Secondly, irradiation is directly applied by means of radium to the bleeding uterine surface and can be controlled more accurately than X rays to suit the requirements of the case. Lastly a single application of radium usually suffices to check the symptoms. In neither method, of course, does radiation cause disappearance of the tumour, although some atrophic regression or degeneration may supervene upon the artificial menopause so induced.

During the third and early fourth decades the conservative operation of myomectomy is the therapeutic measure of choice. Radiation is not a conservative method of treatment, since to be effective it must be used in sufficient

dosage to sterilize the individual. On the other hand, myomectomy is, according to Graves, "one of the most satisfactory operations of modern gynecology." The operation is not easy, and requires skill and a proper technique, but the results in capable hands fully justify the position that it now holds. Should uterine bleeding recur after myomectomy has been performed as a result of endometrial hypertrophy, it should then be dealt with by radiation.

REFERENCE.—¹ *Obstetrics and Gynecology*, 1933, ii, 784, Philadelphia and London, W. B. Saunders Co.

VACCINATION.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—In a paper on *vaccination in early infancy*, O. Jelinek¹ records his observations on 30 infants vaccinated by him, 22 of whom were aged from 9 days to 9 weeks and 8 from 9 weeks to 6 months: 25 (over 80 per cent) gave a positive result. In most cases the operation was performed only once, and in only 4 had it to be repeated from two to four times. In several cases an ulcer formed at the site of vaccination, was slow in healing, and was accompanied by considerable constitutional disturbance. In 19 cases in which vaccination was repeated in from one to three months after the primary insertion, 5 showed well-marked pustule formation with a surrounding inflammatory area and glandular swelling. In another 20 cases intracutaneous vaccination was performed, with two failures, and severe general and local reactions in several instances. Jelinek comes to the conclusion that vaccination should not be made compulsory in early infancy owing to the frequency of failures and the occurrence of severe reactions.

S. W. Marick² states that *generalized vaccinia* comprises two groups of cases. In the first group, in which there is a skin lesion such as eczema or impetigo, generalized vaccinia is due to direct or indirect contact with the vaccination of the same or some other person. Death sometimes occurs in this group, to which the name 'eczema vaccinatum' has occasionally been given. The second group, which is very rare, has been called true or 'spontaneous vaccinia', though 'hæmatogenous' or 'metastatic vaccinia' would be a better term. Whereas in the first group the lesions usually develop at the same time as the primary vaccination, in the second group the generalization usually takes place nine to eleven days after vaccination. Usually it follows a well-marked take, but it is very apt to run a mild course. Marick records an example in a girl aged 3½ years, in which primary vaccination took very strongly and was followed eleven days afterwards by the eruption of several papules on the forehead and later on the body. The lesions continued to appear for over three weeks. No secondary fever ensued, but four weeks elapsed before complete recovery took place. C. J. de Vere Shortt³ records a fatal case of generalized vaccinia in a previously healthy baby aged 3 months. The lesions were distributed over the face, scalp, wrists, left thumb, right buttock, right leg and thigh, and both soles. Death took place on the twenty-seventh day. Post mortem the liver and spleen showed areas of necrosis having the characters of the vaccinia lesions, but the other organs, including the brain and spinal cord, were normal.

F. W. Lynch⁴ reports a case of generalized *pemphigoid vaccinia* in a 6-months female foetus who was born twenty-seven days after the mother's vaccination, the eruption consisting of umbilicated pustules and flaccid bullæ. The child was born alive, but soon died.

B. Kuypers,⁵ who records 24 illustrative cases, states that while chronic splenomegaly in the newborn is rightly regarded as evidence of congenital syphilis, a subacute and transient *enlargement of the spleen* may be due to other causes such as cutaneous suppuration and ordinary vaccination. According

to Lereboullet (*see* MEDICAL ANNUAL, 1932, p. 569), who first described its association with vaccination, splenomegaly is found in 40 per cent of the newborn after vaccination. It lasts a few days longer than the vaccination pustule and disappears at the end of a month at the latest.

H. N. Brunnitzer⁶ made a study of the *local leucocyte picture* in four infants after primary vaccination, and in accordance with what he had found in examination of the general leucocyte picture he was unable to detect any changes characteristic of vaccination.

According to R. Jorge⁷ the characteristic features of *post-vaccinial encephalitis* are as follows: (1) It is a recently described condition, the first cases having been recorded in 1922. (2) Geographical distribution is very unequal. England and Holland are the countries most affected, and an appreciable contingent is supplied by Austria, Germany, Norway, Sweden, and the United States. (3) The neurological symptoms are specific, and the histological picture uniform and characteristic. (4) It has no connection with lethargic encephalitis or acute poliomyelitis. (5) It is most frequent after vaccination between 3 and 13 years and on the tenth and thirteenth day after vaccination. (6) Its very low morbidity is in striking contrast with its very high mortality (58 per cent in England and 43 per cent in Holland and the United States). The arguments in favour of encephalitis being due to vaccine lymph are as follows: (1) The relative constancy of the incubation period; (2) The curative effect of antivaccinial serum; (3) Recovery of the virus from the tissues of the vaccinated person or animal; (4) Experimental vaccinial encephalitis, of which Van Bouwdyk Bastiansee reports a case in a calf and Flexner one in a rabbit.

A case of post-vaccinial encephalitis accompanied by diabetes insipidus is reported by H. R. Roehm.⁸ The patient was a boy, aged 7½ years, who on the seventh day after successful vaccination with glycerinated calf lymph developed polyuria and polydipsia with fever, headache, and chills. A marked change took place in the child's disposition. He became irritable and emotional, and the tendon reflex became much exaggerated. Subsequently improvement took place in his general health and disposition, the urinary symptoms slowly subsiding under treatment by pituitary extract. Roehm has found only one other case on record, reported by Fulgham and Beykirch⁹, of post-vaccinial encephalitis with urinary symptoms.

W. Koelzer¹⁰ maintains that the best method for preventing the occurrence of severe vaccinial reactions is the reduction in the number of insertions from four to one measuring $\frac{3}{4}$ to 1 cm. in length. A dilution of lymph of 1-2000 should be used, as weaker dilutions are liable to prevent a 'take'. Owing to the likelihood of the protective power of vaccination being reduced when only a single insertion is employed, revaccination should take place in the fourth and ninth years of life, one insertion being used for those whose primary vaccination had been unsuccessful and two in those in whom it had taken. The third revaccination should be performed at 12 years of age with four insertions. Owing to the population being usually inadequately protected from the middle of the fourth decennium onwards, a fourth revaccination should be strongly recommended at the age of 35.

J. B. Marin, J. S. Martinez, and J. M. Aguilar,¹¹ who report their observations on 150 cases of *intracutaneous vaccination*, illustrate the efficacy of the method by the fact that revaccination of 117 of these cases by scarification a month after intracutaneous vaccination was invariably negative. The duration of immunity to small-pox after intracutaneous vaccination is at least 4 years according to Leiner. The advantages of the intracutaneous method are that it leaves no scar, causes little or no febrile reaction, enables washing to be continued without risk of auto-inoculation, and is specially suitable for cases

of skin disease where the ordinary method is contra-indicated. On the other hand, the drawbacks of the method are that the dilutions of lymph required do not keep their virulence so long, that the method is more complicated, and sometimes there is an intense general reaction, while post-vaccinal encephalitis is as likely to follow the intracutaneous as the ordinary method.

K. Kundratitz¹² also carried out similar observations on the duration of the immunity conferred by intracutaneous vaccination in 143 children, and found that after 5 to 7 years 79.8 per cent showed various degrees of cutaneous immunity, while 20.2 per cent had lost their immunity. He concludes that intracutaneous vaccination provides a sufficiently long protection against small-pox to justify employment of the method.

REFERENCES.—¹*Arch. f. Kinderheilk.* 1932, xcix, 95; ²*Arch. of Ped.* 1932, Aug. 552; ³*Med. Press and Circ.* 1933, i, 214; ⁴*Arch. Dermatol. and Syph.* 1932, xxvi, 997; ⁵*Thèse de Paris*, 1933, No. 1; ⁶*Zeits. f. Kinderheilk.* 1932, liii, 133; ⁷*Bull. Off. internat. d'Hyg. publ.* 1932, xxiv, 2138; ⁸*Amer. Jour. Dis. Child.* 1932, xlv, 1293; ⁹*Jour. Amer. Med. Assoc.* 1929, xcii, 1427; ¹⁰*Jahrb. f. Kinderheilk.* 1932, cxxxvii, 91; ¹¹*Cronica med.* 1932, xxxvi, 457; ¹²*Wien. med. Woch.* 1932, Nov. 5, 1398.

VARICELLA. (See CHICKEN-POX.)

VARICOSE VEINS. (See BLOOD-VESSELS, SURGERY OF; ULCER OF THE LEG, CHRONIC.)

VARIOLA. (See SMALL-POX.)

VAS DEFERENS, SURGERY OF. (See TESTIS, SURGERY OF.)

VERNAL CATARRH. (See CONJUNCTIVA, DISEASES OF.)

VERTIGO: OPERATIVE TREATMENT OF MÉNIÈRE'S DISEASE.

Geoffrey Jefferson, M.S., F.R.C.S.

The treatment of Ménière's disease has long been a baffling problem. The clinical picture presented by these cases, with their sudden attacks of violent dizziness causing the patients to fall or to clutch at anything which will support them, the vomiting that often follows, the brief prostration after an attack, the deafness which they all present in varying degree either in one ear or both, is clear-cut and easily recognized. No less dreadful than the acute discomfort of these recurring attacks is the fear which they engender and the sense of insecurity and lack of confidence which they bring. It is but rarely that any serious harm has come to a patient through a fall in one of these attacks, but the patients achieve security only by the greatest curtailment of their activities, and in traffic never feel safe. Pathologically the condition is always stated to be due to hæmorrhage into the labyrinth, but there is no evidence to support this view. We now believe the condition to be due to sclerosis of the auditory nerve or of its endings. Not only is the acuity of hearing depressed, but the vestibular portion of the nerve can be shown to be defective by the caloric and galvanic tests. Classically the state is unilateral, but it is not uncommon for some depression of function of the eighth nerve to be present on both sides. When this is so, one side is invariably worse than the other. It is surprising how well the patients are subjectively aware which ear it is that is at fault. W. E. Dandy some time ago proposed **Intra-cranial Division of the Eighth Nerve** as a cure for the condition. He reports 80 cases operated upon without a single fatality.¹ In two of the early cases the facial nerve was injured, but it is generally a simple enough matter to separate the eighth from the seventh and to cut it cleanly.

H. W. B. Cairns and Russell Brain² also have reported 4 personal cases with excellent results. These observers noted diplopia as a transient phenomenon after the operation, and believe it to be of the same nature as the skew-deviation of the eyeballs seen after auditory neurotomy in animals. The diplopia lasted from one to three weeks after operation, and was clinically unimportant. In selecting patients for operation the chief differential diagnostic points lie between four conditions: the acute vertiginous attacks that sometimes herald the onset of disseminated sclerosis; other transient attacks possibly due to vasospasm; Ménière's disease; and acoustic neuromas. In general there is little difficulty in making a differentiation after careful study of the case, and it may be that division of the auditory nerve for vertiginous crises may come to occupy a parallel place with section of the sensory root for trigeminal neuralgia. Certainly it is a safer procedure than labyrinthectomy.

REFERENCES.—¹*Amer. Jour. Surg.* 1933, June, 693; ²*Proc. Roy. Soc. Med.* 1933, April, 689.

VESICULÆ SEMINALES, SURGERY OF. (See TESTIS, SURGERY OF.)

VITAMINS. (See also DIETETICS; FOOD AND THE PUBLIC HEALTH.)

Ivor J. Davies, M.D., F.R.C.P.

A full abstract of the first edition of the Medical Research Council's Report, "The Present State of Knowledge of Accessory Food Factors", was made in the MEDICAL ANNUAL for 1928 (p. 525). Complete revision was again undertaken by the Committee in 1930. The Report issued in 1932¹ entitled "Vitamins: A Survey of Present Knowledge," is an entirely fresh resumption of current knowledge and of technical methods in this subject. The Council state that it is hardly possible to issue fresh revisions of this monograph in view of the rapid and accelerating growth of the subject. They hope that a new periodical journal, *Nutrition Abstracts and Reviews*, will in future provide a regular means of presenting the results of research from many fields of work—medical, agricultural, dietetic, and commercial—in which the subject of nutrition is being so rapidly developed. In an appendix to the present Report is given the Report of the International Conference on Vitamin Standards, held under the auspices of the Permanent Standards Commission of the League of Nations in London during June, 1931. The recommendations given here for adoption of international standards for those vitamins of which present knowledge makes this practicable, together with definitions of units of activity in terms of the standards for use in each case in quantitative estimation of the vitamin, have now been adopted by the League of Nations. In their first Report of 1919 the Committee referred to the scepticism then shown in some quarters even of the real existence of the subject of their monograph. They admitted that there was then no knowledge of the actual chemical nature of the vitamins, but they said that "the study of their functions is progressing on real and objective lines, and has become in certain cases even quantitative". It is gratifying to notice that within a dozen years research work has advanced so far as to allow not only quantitative study, but a formal international agreement upon precise quantitative standards in the case of no less than four—the so-called A, B₁, C, and D—of the vitamins.

Professor E. Mellanby² (Sheffield) in the Cameron Prize Lecture delivered before the University of Edinburgh, reviewed the problems relating to the fat-soluble vitamins. They involve many subjects of physiological, pathological, and medical interest—bone and tooth calcification, rickets, dental caries, pyorrhœa alveolaris, epithelial hyperplasia and metaplasia, infection, and nerve degenerative disease. It was suggested that the harvest may ultimately prove

to be a rich one, for the whole subject of the relation of diet to health and disease has hardly yet passed its pre-registration stage.

It is only possible in this article to refer briefly to the practical aspect of these essential food factors.

Vitamin A.—After the recognition by McCollum and Davies (1913) of the existence of a fat-soluble vitamin necessary for growth, observations gradually accumulated which indicated that more than one necessary food factor was present in some of the natural fats and oils. A convenient starting-point for the history of the further development of the subject is found in the recognition by E. Mellanby of rickets as a deficiency disease. He was able to demonstrate that experimental rickets could be induced in puppies by withholding from the diet a substance (the antirachitic vitamin) which appeared to be similar as regards distribution and properties to the fat-soluble vitamin A. Although calcium and phosphorus deficiencies were naturally of importance, the potency of the antirachitic vitamin in effecting the calcification of bone was so pronounced as to imply that the substance held a key position in the etiology of rickets. Cod-liver oil was much superior to all the other fats tested (e.g., beef suet, butter, lard, and various vegetable oils) in promoting the calcification of bone and in preventing rickets.

It is now accepted that vitamin A (the antixerophthalmic vitamin) and vitamin D (the antirachitic vitamin) are distinct fat-soluble dietary factors, both of which are required by mammals for satisfactory growth and nutrition.

The present state of knowledge of the action of vitamin A and the part it plays in health and disease is far less advanced than that relating to vitamin D. Apart from xerophthalmia, many observers had noticed that animals deprived of the fat-soluble vitamin complex were highly susceptible to infection, especially infection of the lungs and alimentary tract. That this increased susceptibility was due to deprivation of vitamin A and not to lack of vitamin D suggested itself to Mellanby when he described an outbreak of bronchopneumonia among experimental puppies.

In 1928 Green and Mellanby published an account of a large-scale experiment made to determine the cause of death in young rats deprived only of vitamin A. They found, almost without exception, that animals under these conditions died of infection with the following numerical distribution:—

Xerophthalmia, 38 per cent.

Abscess at base of tongue, 72 up to 90 per cent.

Infection of lungs, 9 per cent.

Infection of genito-urinary tract (including renal and bladder calculi), 44 per cent.

Middle-ear abscess and septic nasal sinuses, 20 per cent.

With increasing age the lungs of the animals were more often infected. The addition of a rich source of vitamin A such as butter or cod-liver oil completely prevented these infections, and when added to the diet of animals with these infective foci usually brought about a cure if given in reasonable time. Mellanby and Green also discovered that **Carotene**, the yellow pigment of carrots, and also found in green vegetables, acts curatively and prophylactically towards infection in rats in the same way as vitamin A. These results led them to call vitamin A the anti-infective vitamin in order to focus attention on what seemed to be its most prominent physiological action in animal experimental studies.

Vitamin A and some Human Infective Conditions.—So unequivocal are these experimental results on infection that there is little wonder that the possibility of human infection being related to vitamin A deficiency immediately suggested itself. The clinical investigations refer to puerperal sepsis, pneumonia, and measles. The results suggest that both prophylactically and

therapeutically diets rich in vitamin A have some value in certain types of human infection.

Vitamin A and the Nervous System.—In 1926 Mellanby described the production of degenerative changes in the central nervous system by diets rich in cereals and deficient in fat-soluble vitamins. Of all the cereals tested, one stands out as an exception to the general rule—namely, yellow maize. With a diet deficient in vitamin A white maize results in degenerative changes, while with yellow maize the cord is normal. The anomalous position of yellow maize is due, no doubt, to the protective action of its yellow pigment, carotene. Moreover, Mellanby found that degeneration of the medullated nerve fibres is not confined to the central nervous system but also affects the peripheral nerves extensively, and more intensely on the afferent side. The other sensory nerves, including the optic, the vestibular and cochlear divisions of the eighth, and the trigeminal, suffer in the same way. Thus it would appear that hemeralopia and loss of balance produced in animals by vitamin-A-deficient diets are largely due to degenerative changes in the nerves responsible for sight and balance respectively.

The significance of these discoveries as regards nervous disease in human beings is then discussed, more particularly in relation to convulsive ergotism, pellagra, and lathyrism. In familiar nervous diseases such as disseminated sclerosis, subacute combined degeneration, tabes dorsalis, and other neurosyphilitic affections there is no evidence that they are due to a deficient intake of vitamin A in the same sense as applies to the first-named group. On the other hand, vitamin A and probably other dietetic factors obviously increase the resistance of nervous tissue to those toxins which tend to produce demyelination, while cereals tend to favour such degenerative changes, and therefore diet may have some relation to the nervous diseases mentioned.

The experimental facts seem to suggest that the curative and preventive effect of whole liver in subacute combined degeneration is due to a fat-soluble factor—probably vitamin A—one therefore quite distinct from the water-soluble factor which is curative of the blood condition in pernicious anemia.

There are two facts Mellanby urges upon those testing the effect of diet on subacute combined degeneration of the cord. The first is that in addition to making the diet very rich in vitamin A and carotene by giving liver fats (fish and mammalian), egg-yolk, cabbage, carrots, etc., a high calcium intake be also guaranteed by including two pints of milk daily, and the cereal intake be reduced and the potato intake correspondingly increased. The second point specially emphasized by Baker, Bordley, and Longcope is the necessity of carrying out the dietetic treatment for many months—many of their cases only showed any great improvement after nine months. In early disseminated sclerosis treated early in the course of the disease Mellanby found almost without exception a great improvement even when the symptoms had been extremely severe. Here again he emphasizes the importance of continuing the diet for many months and including milk (2 pints daily), egg-yolk (2 eggs), liver (or liver and fish fats), green vegetables, carrots, and potatoes, with a reduction of cereals.

The Vitamin B Complex.—For recent work on the multiple nature of this vitamin the Medical Research Council's Report must be consulted.

Vitamin C (Antiscorbutic).—

Effect of Heating.—The conclusion drawn from the guinea-pig experiments of Holst and Fröhlich (1912) is that when cooked for one hour at temperatures ranging from 80° to 100° C., cabbage leaves lose about 90 per cent of the antiscorbutic value originally possessed. In a similar manner the loss on heating in water either (1) for sixty minutes at 60° C., or (2) for twenty

minutes at 90° to 100° C., was estimated at about 80 per cent of the original. The conclusion to be drawn from these considerations is that for those articles of food upon which dependence is placed for protection from scurvy, all forms of slow cooking should if possible be avoided. In the case of fresh meat of inferior quality it is often necessary to resort to slow stewing in order to provide an appetizing meal, but in such cases efforts should always be made to cook the vegetables separately and for as short a time as possible.

The commercial process of canning vegetables also leads to a considerable degree of destruction of the vitamin C in vegetables like cabbage and runner beans, whereas in tomatoes very little destruction occurs unless there is exposure to air.

Vitamin D (the Antirachitic Vitamin) and Rickets.—The remarkable series of investigations which led to the separation of this vitamin from what was formerly called vitamin A, and in which Professor Mellanby took so distinguished a part, is described. It became an established fact that when the skin was irradiated by ultra-violet light the increased calcification of bones was really due to the production in the skin of the antirachitic vitamin D from its precursor, ergosterol. This part of the story ended with the preparation in the laboratory of vitamin D in the pure form and so reduced to a single factor the influence of both the antirachitic vitamin and ultra-violet radiations.

It is impossible here to describe the steps in the isolation of crystalline vitamin D (calciferol). The final stages in the isolation of the vitamin now appear to have been reached concurrently in England and Germany, and fittingly in the same laboratories in which the original discovery of the parent substance of vitamin D was simultaneously made in 1927. Thus it now seems probable that calciferol (vitamin D₂ of the German workers), a stable crystalline substance of the highest rachitic activity yet obtained, is vitamin D in a state of purity.

The chief sources of vitamin D in the ordinary food supplies of human beings are milk, butter, eggs, and, to a very small extent, fresh green salads and vegetables. For therapeutic purposes cod-liver oil and certain other oils are valuable, and in some cases proprietary preparations of irradiated ergosterol of stated potency are useful.

There are other constituents of food which influence bone calcification and growth, and as these vary in a diet so also does the absolute amount of vitamin D necessary for good bone formation. For instance, however much vitamin D is ingested, if the diet is very deficient in calcium and phosphorus or in one of these, bone defect must result.

One practical aspect of the action of other food-stuffs was emphasized. Cereals are rickets-producing substances, partly because they lead to increased growth without at the same time supplying to bones a sufficiency of calcium, phosphorus, and calcifying vitamin, and partly because the calcium and phosphorus they contain are not retained in the body. In infants and young children where bone formation is rapid and the mechanism insecure it is better to avoid or reduce to a minimum the intake of cereals. When the diet is rich in calcium and phosphorus, as, for instance, when milk forms the main bulk of the diet, and cereals are absent, vitamin D is of relatively less importance, although all infants and children in this country ought to take some cod-liver oil daily, partly because of its vitamin D content but also because of its other constituents, including vitamin A and iodine.

Vitamin D and the Teeth.—M. Mellanby's experiments are described which prove that an ample supply of vitamin D is of greater importance in determining the perfect development of the teeth than an abundant or carefully

balanced supply of calcium or phosphorus. It is now possible to produce at will in animals teeth of all degrees of texture—from perfect structure to the greatest degree of imperfection—by making variations in the food ingested. The earlier stages of calcification are more unstable than the later ones; thus it is more important to get the beneficial influences to work as early as possible; and this can be accomplished only by suitably feeding the mother during pregnancy and the infant in its early months of life.

The dietetic conditions which favour the formation of perfectly calcified teeth are also those which raise the resistance to dental caries, and the latter process can be stimulated even in badly formed and carious teeth.

Heated Cow's Milk.—A question of great moment is the influence of heat upon the nutritive value of cow's milk, and in certain respects the evidence on this question is conflicting. The evidence as to any deleterious effect of careful pasteurization on the nutritive properties of cow's milk is not decisive. It is in any case at present advisable to pasteurize the ordinary milk-supply to prevent the spread of milk-borne diseases. Owing to the variability of the vitamin content of milk, whether heated or raw, it is wise in all cases to supplement a diet of milk with vitamin additions.

Vitamins and Human Diets.—The most important chapter in the Council's monumental Report is under this heading. The following particulars can alone be quoted. So far as western civilization is concerned, it is no doubt true that the rareness of the occurrence of frank deficiency diseases, such as scurvy, xerophthalmia, and beri-beri, indicates that an absolute deficiency of vitamins scarcely ever exists in the individual diet. On the other hand, it is now becoming generally recognized that much subnormal health and development, and even incidence of disease, are associated with a partial deficiency of one or more of these accessory substances. The influence of such partial deficiencies, even when relatively slight, may be extremely serious when they occur in very early life, and if we may judge from the results of experiments on animals, an adequate supply of these indispensable dietary components later in life may fail to make good the damage caused by a deficiency in youth. There is also danger that the effects of such a partial or latent deficiency may persist as a chronic condition throughout adult life. It is difficult to provide convincing evidence of this, since the well-known symptoms which characterize the disease may not be present, and the only method of clinching the diagnosis would be to make widespread therapeutic trials with the vitamin or vitamins suspected to be deficient and to observe whether general improvement in health took place. Green and Mellanby have pointed out how wide is the margin between the doses of vitamin A which will just maintain a rat in life, if it is not attacked by infection, and the dose which will wholly prevent those infections. The latter dose is about four times as great as the former. Animals receiving doses between these maximum and minimum amounts, while showing no overt symptoms of vitamin A deficiency, yet suffer from a partial or latent deficiency and are proportionately liable to infection in consequence. This example serves to show that a latent deficiency disease is a real thing and not an imaginary concept.

When the diet of the poor is considered, the general situation is even worse. Cereals are said to form 60 per cent of the total food consumed in this country, and in the diet of the poor this percentage is higher because of the relative cheapness of this form of food. Cereals, although they provide the necessary energy, are almost devoid of vitamins A and D, and have been shown to have an antagonizing action on the latter, while the high cost of milk, butter, eggs, and vegetables, which are the usual sources of these vitamins, limits their acquisition by the poor.

Vitamin Requirements in Sickness and Convalescence.—In sickness or convalescence special efforts should be made to supply a diet complete in all essentials. This section of the Report should be most carefully studied, as it will be universally agreed that in this connection a real risk of deficiency in diet arises.

In the above paragraphs a large amount of the Council's epoch-making Report has been quoted with a view to a careful study of the whole work. There is much highly technical matter, but the work abounds in practical applications of vital value to the practitioner. The day is not far distant when our patients will expect a prescription of diet and not a bottle of medicine.

Avitaminosis A.—L. J. Harris, J. R. M. Innes, and A. S. Griffith³ (Cambridge) have studied the development of the lesions of a- or hypovitaminosis A in rats. The metaplasia (or hyperplasia) and keratinization of epithelium is confirmed, and its loss of normal structure and function regarded as the essential feature of the deficiency. The infections found in vitamin A deficiency are of a special type, limited in origin to epithelial tissues, and not seen in the absence of neighbouring keratinization. With provision of vitamin A, the epithelium becomes normal again and the local infections disappear. If the avitaminosis is allowed to develop, the local infections spread, and the destruction of the integrity of the epithelium is presumably responsible for absorption of the fortuitous infection micro-organisms (normally non-pathogenic), and septicæmia may result.

The claim that rats become susceptible to tuberculosis when depleted of vitamin A, which appears to support the theory of a generalized anti-infective action for the vitamin, could not be substantiated. The existing data afford no basis for the belief that vitamin-A therapy is likely to be effective in combating acute general infections due to specific highly pathogenic micro-organisms, or in those clinical toxæmias and infectious diseases which are unassociated with the peculiar structural breakdown of epithelial tissue, and the attendant localized infection, which characterizes the vitamin deficiency. The importance of ensuring that diets are adequate in vitamin A cannot, of course, be gainsaid.

Relation of Diet to Infection.—A. F. Hess⁴ (New York) has made a clinical study of the relationship between composition of the diet and susceptibility to infection. He draws the following conclusions. The antirachitic factor, whether given as ultra-violet irradiation, as irradiated ergosterol, or as cod-liver oil, does not increase the immunity of infants to respiratory infections. Respiratory infections are not due to a lack of vitamin A and generally cannot be lessened by giving a diet rich in this factor even when supplemented with cod-liver oil. The average infant seems to receive an adequate amount of vitamin A in its milk, judging by the fact that xerosis of the eyes is exceedingly rare, and no gain in weight or increase in immunity is brought about by adding vitamin to the diet. The same seems to hold true for older children and adults, in view of the infrequency of night-blindness, the first sign of this deficiency. A lack of vitamin C may induce heightened susceptibility to infection of the respiratory tract. It may, however, induce merely local susceptibility without appreciable loss of systemic immunity. This peculiar phenomenon is manifested by the occurrence of typical nasal diphtheria, associated with virulent diphtheria bacilli, but a Schick reaction negative to highly potent solutions of toxin.

Vitamin B₂ (G).—B. Sure⁵ (Fayetteville, Ark.) makes a historical survey of the present status of our knowledge of vitamin B₂ (G). During the last few years it has been definitely established that the dietary factor which McCollum and Kennedy in 1916 termed water-soluble B, generally recognized

as a growth-promoting and appetite-stimulating substance, is a mixture of vitamin B or vitamin B₁ and G or B₂. One of these is relatively thermolabile and has antineuritic and growth-promoting properties; the other is more stable after heating under pressure and also possesses growth-promoting properties, and functions in the prevention and cure of pellagra-like symptoms in the rat. The former is also referred to as the anti-beri-beri, and the latter as the antipellagic vitamin. The nomenclature of these two dietary essentials has not yet been finally settled. The American biochemists have adopted the letter 'B' for the anti-beri-beri factor and the term 'G' for the anti-dermatitis vitamin. In this communication the term B₂, tentatively adopted by the biochemists of England, will be employed to represent the antipellagic vitamin. Recently Roscoe produced experimental evidence to the effect that vitamin B₂ is a complex composed of two dietary essentials. She found that when egg-white is given as a source of vitamin B₂, the lack of a third factor, which she tentatively termed 'Y', necessary for the normal growth of the rat, becomes apparent. "This factor is present in autoclaved yeast extracts and in watercress, lettuce, spinach, and cabbage, but the amounts present in lettuce and etiolated cabbage leaves are less than in the dark green leaves tested, and the amount present in the onion bulb is still smaller."

F. P. Underhill⁶ (New Haven, Conn.) discusses the clinical aspects of vitamin G deficiency. He states that in the present state of knowledge one may accept the view that, although vitamin G deficiency is closely related to pellagra, some caution must be exercised in relying on this vitamin deficiency as being entirely responsible for the etiology of the disease. This caution is especially pertinent when preventive or curative measures are to be advocated. The discovery of the potency of the unknown factor termed vitamin G is an undoubted advance in the knowledge of pellagra, but it is clearly unwise to assume that vitamin G deficiency and pellagra are necessarily synonymous terms. In view of the experimental data available, there appears the possibility that there may be several deficiencies involved in the disease condition under discussion.

Underhill quotes Roberts, who presented detailed records of 25 patients developing pellagra whose tables contained an abundance of well-balanced food. Roberts shows that not one of these patients ate a well-rounded diet of meat, milk, eggs, or wholesome vegetables. "There is apparently among the better classes a small proportion who have a natural or acquired antipathy to a well-rounded balanced diet. Is there a dietary hysteria? Some persons pride themselves on never getting hungry. Grief, monotony, disease, domestic worries, the preparation of food, constipation are agents in depriving women more than men of their appetites. In this series there were only four men and twenty-one women."

Rôle of Minerals and Vitamins in the Diet.—A. Brown and F. F. Tisdall⁷ (Toronto) believe that more care should be taken to ensure an adequate supply of both minerals and vitamins in the diet. The importance of these food essentials in the maintenance of normal growth and resistance against infection is not as widely recognized as it should be. Unfortunately we do not know the exact requirements of these food essentials, nor do we know the exact amounts furnished by many foods. We do know, however, that owing to the ease with which we can obtain purified carbohydrates, we are apt to suffer from insufficient amounts of minerals and vitamins, and, in occasional cases, of proteins. Nevertheless one can go a long way towards overcoming the deficiencies so frequently encountered in the average diet by building up our meals around five essential articles of food—namely, milk, to supply calcium and protein; meat, to supply protein; eggs, to supply protein,

vitamins, and iron; and vegetables and fruit, to supply minerals and vitamins. The remaining calories required can be furnished readily by the refined cereal and sugar products.

Constipation and Vitamin B Deficiency.—J. F. Montague⁸ (New York) writes on the relation of vitamin B deficiency to constipation. He believes that in many instances the constipation is due not to lack of bulk to excite action of the nerves of the bowel wall, but to lack of that intangible 'essential food factor' resident in the 'bulky food'. He believes that vitamin B deficiency is much more common than was supposed possible, and while there is not at present proof that all constipation originates in this way, the data already gathered show that a large enough proportion is so caused to make it essential to keep this etiological possibility in mind whenever a case offers puzzling features which prevent its ready classification and confuse the requirements of successful therapy. To overcome any practical difficulty in the way of dietetic reform, he had recourse to supplementary feeding, and used **Bemax** as the source of the cereal embryo.

Carotene and Vitamin A.—B. Woolf and T. Moore⁹ (Cambridge) have examined the claims of Olcott and McCann and the hopes held out by Bowden and Snow that they have effected the transformation of carotene to vitamin A *in vitro*, and affirm that much more evidence is needed before their claim to have produced the vitamin can be regarded as a strong one. They mention some preliminary experiments of their own on the changes undergone by carotene under various conditions which may serve to show the complexity of the subject and the care needed in the interpretation of results.

Chemical Identification of Vitamin C.—L. J. Harris, Isobel Mills, and J. R. M. Innes¹⁰ (Cambridge) confirmed the antiscorbutic action of a preparation of **Hexuronic Acid** from suprarenals by means of a striking curative test and by the tooth-structure method: 1 mgrm. of the hexuronic acid (an old specimen) was found to have an activity somewhat greater than 1 c.c. of orange juice. Preliminary experiments have established the high antiscorbutic activity of raw suprarenal cortex, roughly proportional to its high hexuronic acid content. Professor Szent-Györgyi¹¹ first isolated hexuronic acid in 1928, and concluded that it was identical with the reducing substance which is found in active vitamin C concentrates.

Relation of Ultra-violet Light to Nutrition.—Harriette Chick¹² (London) reviews the stages in the knowledge of the relation of ultra-violet light to nutrition in the Oliver-Sharpay Lectures for 1932, delivered before the Royal College of Physicians of London. The following conclusions were drawn from the observations of herself and collaborators¹³ in the post-war years at Vienna: (1) Exposure to sunshine in summer prevented and cured rickets in children receiving a diet on which the disease developed in winter; (2) Rickets could be prevented in winter by cod-liver oil added to the diet; (3) No difference could be detected between the curative effect on rickets of cod-liver oil, of sunshine, or of ultra-violet irradiation from an artificial source; (4) The ultra-violet rays in sunshine are the effective ones, since no curative effect was experienced from sunshine that had traversed window glass. These results provide an exact parallel to those obtained from the experimental work with rats and dogs. Vienna at this time provided a second striking example of the effect of sunshine on the course of another nutritional disease, in the epidemics of hunger osteomalacia which occurred in the city each winter and spring from 1918-20. The disease showed a seasonal incidence resembling that of rickets, and in a series of dietetic observations, patients in hospital showed swift improvement on diets containing abundant animal fats, while cod-liver oil, even when given with a poor diet, proved to be a specific cure,

The mode of interaction of diet and sunlight and the identification of vitamin D were described, and also the recognition of ergosterol as pro-vitamin D and the isolation from irradiated ergosterol by R. B. Bourdillon and his colleagues¹⁴ of the crystalline substance which they have called calciferol, a substance which has every appearance of being the pure antirachitic vitamin D.

The mechanism of the antirachitic action of sunlight was discussed. If it be assumed that the antirachitic rays can penetrate the epidermis and reach the capillaries, there might be a direct action on the blood. Clark has shown that irradiation with ultra-violet rays causes an increase in the diffusible calcium in serum, and this action may be involved in the calcifying action of sunlight.

There is thus abundant proof that vitamin D, whether supplied ready made as cod-liver oil or as irradiated ergosterol, or made in the animal by direct irradiation, is the dominant factor regulating the metabolism of calcium and phosphorus in the body. It is advisable that extra calcium salts should be given in the initial stages of antirachitic therapy to avoid a temporary lowering of the blood calcium and a risk of tetany. The proved effects of ultra-violet irradiation on the calcium and phosphorus metabolism may, however, be so far-reaching as to affect every department of the living economy. Although the bones and teeth contain most of these elements, every tissue in the body needs a sufficiency of both calcium and phosphorus for its correct functioning, and if, from any cause, the correct utilization of these minerals is disorganized, it is clear that the whole organism will suffer. This is especially true at those times in life when the need for these minerals is greatest, as, for example, when extra supplies are required to support the growth of the bony tissues in children or to bear the strain of pregnancy or lactation in women.

The vitamin-D-containing foods—butter, eggs, cream, and milk—are, however, the expensive foods, and the problem is to obtain the necessary supply of antirachitic vitamin for the poorer section of the population in the most economical way. For infants and growing children it is probable that a small daily ration of **Cod-liver Oil**, given especially during the winter months, is the surest and most economical procedure. Abundance of calcium salts and phosphates in the diet will enable the available vitamin D to work to better advantage. **Milk** is the most valuable source of these minerals, and while full cream milk is expensive, separated milk is cheap and might well be included more widely in the ordinary dietary. It is imperative to make full use of the relatively small amount of natural **Sunlight** with which our climate is endowed. In winter, spring, and autumn the play hours for children out of doors should be arranged to coincide with the period round about noon, when the sunshine contains its maximum antirachitic radiation. In the use of artificial sources of ultra-violet radiation, it should be remembered that many of these (e.g., the mercury-vapour quartz arc) emit powerful radiations of very short wave-length, which are absent from the sun's radiation reaching the earth on which the human race has been evolved. The action of these rays on the living organism is little understood, and their use should only be permitted under strict medical supervision. Chick's lectures should be carefully studied as an authoritative account of the facts, and her practical suggestions deserve general application to the preservation of health and the prevention of disease.

REFERENCES.—¹*Vitamins: A Survey of Present Knowledge*, 1932, Medical Research Council, H.M. Stationery Office; ²*Edin. Med. Jour.* 1933, April, 197; ³*Lancet*, 1932, ii, 614; ⁴*New Eng. Jour. Med.* 1932, Oct. 13, 637; ⁵*Jour. Amer. Med. Assoc.* 1932, July 2, 26; ⁶*Ibid.* July 9, 120; ⁷*Brit. Med. Jour.* 1933, i, 55; ⁸*Med. Jour. and Record*, 1933, April 19, 314; ⁹*Lancet*, 1932, ii, 13; ¹⁰*Ibid.* 235; ¹¹*Biochem. Jour.* 1928, xxii, 1387; ¹²*Lancet*, 1932, ii, 325, 377; ¹³*Ibid.* 1922, ii, 7; Med. Research Council Special Report, Ser. No. 77, 1923; ¹⁴*Proc. Roy. Soc. Med.* 1931, cviii, 340; *Ibid.* 1932, cix, 488.

VITREOUS HÆMORRHAGES, RECURRENT (Eales' Disease).*Sir Stewart Duke-Elder, M.D., F.R.C.S.*

A summary of our knowledge of this condition has been made by H. P. Hutchinson,¹ together with a report of five carefully annotated cases. The disease is not a common one, and occurs in adults, especially males, between the age of 15 and 25. It is characterized clinically by recurrent hæmorrhages into the vitreous chamber. The disease is confined to the eye and is not necessarily associated with any constitutional disorder. There is therefore no danger to life.

PROGNOSIS.—The immediate prognosis as regards vision is bad. Both eyes are usually affected, one less severely than the other. Recurrences are likely to occur for months or years, with greater or less obscuration of vision. Between the attacks, vision may return almost to normal. The ultimate prognosis depends on the magnitude of the hæmorrhages and their damage to the retina and vitreous, the duration of the disease, and the occurrence of complications. A number of large hæmorrhages may do irreparable damage to the eye, producing extensive scars in the retina and permanent opacities in the vitreous. On the other hand, very large vitreous hæmorrhages, if not too frequently repeated, may be almost completely absorbed and good vision recovered. However, even if this occurs, there is grave danger that the retina may be detached by the growth and contraction of fibrous bands attached to it, and the eye is almost certain to become blind in time. The eye may be lost through the occurrence of chronic glaucoma while the disease is still progressing, but this is uncommon.

ETIOLOGY.—The etiology of this disease is unknown, although most clinicians consider it tuberculous, or tuberculo-allergic. Hutchinson thinks that there is no satisfactory evidence that tuberculosis, either local or remote, is a cause. The disease is probably due to deficiency in some blood constituent, or to the presence of some toxic product, causing damage to the endothelium of the smaller branches of the retinal vessels, with resultant diapedesis. The occurrence of the hæmorrhages chiefly in the eye may be due to the lack of supporting connective tissue around the retinal vessels.

REFERENCE.—¹*Brit. Jour. Ophthalmol.* 1932, xvi, 513.

VOLVULUS. (*See* **INTESTINES, SURGICAL DISEASES OF.**)**VOMITING IN INFANTS.** (*See* **DIARRHŒA, ACUTE, AND VOMITING IN INFANTS.**)**WEIL'S DISEASE.** (*See* **JAUNDICE, SPIROCHÆTAL.**)**WHOOPIING-COUGH.***J. D. Rolleston, M.D., F.R.C.P.*

EPIDEMIOLOGY.—P. Stocks and M. N. Karn¹ maintain that whooping-cough is now the most important epidemic disease in London in causing physical suffering, loss of school attendance, impairment of physique, and mortality. The mean annual incidence of whooping-cough in children under 10 in Battersea during the quinquennium 1925-9 was about 60 per 1000 living and the fatality rate 1.26 per cent. In the first two years of life the fatality rates were 4.0 and 3.3 per cent respectively, 0.7 at ages 2 to 5, and 0.2 per cent at ages 5 to 10. In Battersea and Greenwich whooping-cough epidemics tend to show a biennial periodicity; a summer epidemic is often immediately followed by or merges into a winter epidemic subsiding by midsummer, and then follows a year of low incidence. The writers attribute the termination of epidemics and their periodicity to a latent immunization of contacts as in measles, though the immunity lasts only about a year instead of two or three. The occurrence of triennial latent immunization is indicated by: (1) Measurement of the rise

and fall of apparent infectiousness of cases to other children in the same house during six years in Battersea; (2) Measurement of the frequency of second cases in houses after different intervals of time during a decade in Greenwich; and (3) Analysis of the attack rates among home contacts in Holborn and Battersea during several years following exposure to infection as compared with those among control groups of children. The writers estimate that about 60 per cent of London children have whooping-cough by the tenth year and about 61 per cent at some time during life. The bulk of the remaining 40 per cent escape by some kind of immunity, which in some is due to repeated acquisition of transient latent immunity and in others to inherent immunity to the disease. The chief differences between the epidemiology of whooping-cough and measles are that in whooping-cough: (1) Epidemics are usually spread over a year instead of six months; (2) Latent immunity lasts about a year instead of two or three; (3) About 60 per cent of children are attacked at some time during life instead of about 90 per cent; (4) There is probably inherent immunity in a certain proportion, but not in measles; and (5) The ratio of latent to manifest infections is lower.

SYMPTOMS AND COMPLICATIONS.—E. Mourrut² illustrates the frequency of *convulsions* in whooping-cough by the fact that 10 per cent of all the children admitted to the Hôpital Bretonneau, Paris, from October, 1931, to October, 1932, developed this complication. With the exception of two children aged 7 years, the convulsions occurred only in infants. They are most likely to develop in attacks in which a complication already exists, especially bronchopneumonia or otitis. The prodromal symptoms consist in torpor and rise of temperature, and are followed by clonic convulsions. Mourrut never saw any case with clinical signs of meningitis, although the cerebrospinal fluid, which was always clear, sometimes showed chemical and cytological changes. (But see **STREPTOCOCCUS INFECTIONS**.) The gravity of the complication is shown by the fact that 21 out of 24 cases (87.5 per cent) were fatal. The pathological changes vary. Encephalitis was found in only one-fifth of the cases on which a necropsy was performed; in the majority only congestion or œdema was present without any specific lesions. (See also **MEDICAL ANNUAL**, 1931, p. 509.)

DIAGNOSIS.—A. Fasbender³ studied the *sedimentation rate* of the red corpuscles in 90 children in the paroxysmal stage. The ages ranged from 5 weeks to 9½ years, a third of the children being under 18 months. In 93 per cent the rate was protracted or normal. On the other hand, 24 per cent did not show the characteristic lymphocytosis. The sedimentation rate was distinctly protracted in the early stage of the disease, when the typical blood picture was present in only one case. In ordinary bronchitis the sedimentation rate is also protracted in a third of the cases, but the absence of the typical lymphocytosis facilitates correct diagnosis in such cases. Fasbender also examined 36 children, aged from 6 weeks to 5½ years, in whom whooping-cough was complicated by pneumonia, influenza, otitis, tuberculosis, or syphilis, and found an acceleration of the rate which though not considerable took several weeks to return to the normal level. He concludes that in most cases the combined examination of the sedimentation rate and the differential count facilitates the diagnosis of whooping-cough.

PROPHYLAXIS.—During the last four years L. Sauer⁴ has injected about 300 susceptible children, aged from 9 months to 3 years, with 7 to 8 c.c. of a pertussis **Vaccine** of which 1 c.c. contained ten billion organisms. The vaccine was made from 5 to 7 recently isolated hæmolytic strains, and was given hypodermically in divided weekly doses. The local reaction was transient. In 60 per cent the leucocyte count at the time of the last injection ranged from 12,000 to 15,000 per c.mm. There were 8 certain and 121 probable exposures without any child contracting whooping-cough.

TREATMENT.—O. Barbour^b treated 85 cases by various **Endocrine Drugs**, viz., suprarenal extract, or thyroid and suprarenal, or thyroid and suprarenal extract combined with a non-specific protein, with the following results. In 44 cases there was a striking improvement in the symptoms within one or two days, and a complete disappearance of the cough within one to four weeks; following the use of suprarenal extract. In 14 cases relief followed the administration of thyroid and suprarenal extract, and complete recovery ensued within one or two weeks; 23 patients responded very well to combined endocrine and protein-therapy, with a complete disappearance of the cough within two to four weeks. In four cases there was little or no effect, and there were no complications or sequelæ.

R. Ungar^c treated 72 cases in children, aged from 0 to 15 years, with whooping-cough **Vaccine** or a mixed vaccine in which Bordet-Gengou bacilli were combined with *B. influenzae*, *Staphylococcus aureus*, *Sta. albus*, pneumococcus, and *Micrococcus catarrhalis*. Thirty-seven children, aged from 2 to 16 years, served as controls. In 59 the treatment was successful and in 13 a failure. Ungar came to the conclusion that early vaccine treatment in the incubation stage, the catarrhal stage, or at the latest in the first week of the paroxysmal stage, combined with treatment in the open air, has a favourable effect in most cases. A transient rise of temperature may follow the treatment, but usually subsides in twenty-four hours. There may also be a temporary increase in the number and severity of the attacks when the vaccine is first used at the commencement of the paroxysmal stage.

REFERENCES.—¹*Jour. of Hyg.* 1932, xxxii, 581; ²*Thèse de Paris*, 1933, No. 143; ³*Zeits. f. Kinderheilk.* 1933, liv, 595; ⁴*Jour. Amer. Med. Assoc.* 1933, c, 239; ⁵*Arch. of Pediat.* 1932, Dec., 816; ⁶*Med. Klin.* 1933, xxix, 290.

WOUND TREATMENT BY BACTERIOPHAGE. (See also BONES AND JOINTS, TREATMENT OF INFECTIVE CONDITIONS; STAPHYLOCOCCUS INFECTIONS.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

Staphylococcus Bacteriæmia.—F. C. Frisbee and W. J. McNeal¹ refer to bacteriophage in staphylococcus bacteriæmia, and summarize their paper thus: (1) It has been possible to produce a staphylococcus bacteriophage which is highly potent against a large majority of bacteria of this species found in infections of the blood stream, and to prepare this agent in a nearly protein-free medium. (2) Use of this bacteriophage by external application, by subcutaneous injection, and, above all, by intravenous injection, in a series of 15 patients with staphylococcus bacteriæmia, has been followed by death in 8 and recovery in 7 patients. (3) The treatment is not a simple procedure, and the course of the disease leading to recovery is quite prolonged. (4) Bacteriophage is a remedial agent which, when carefully and intelligently employed, may be expected to assist somewhat in the treatment of staphylococcus bacteriæmia, a disease that must still be regarded as extremely grave.

Polyvalent intestinal and other bacteriophages are now on the market.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1932, Oct., 1150.

X-RAY DIAGNOSIS.

James F. Brailsford, M.D.

ANATOMY.

Sir George Newman's speech¹ at the opening of the Annual Congress of the British Institute of Radiology in 1932 contained the following statement: "When I was trained as a medical student, a great many years ago, I had to learn my anatomy on the dead body. But we may now by means of X rays learn in the ideal way (which we thought of in those far-off days as impossible to reach) of the anatomy of the living body; ideal, because all

the tissues of the human frame are different in the dead body from what they are in the living. The X ray has therefore real weight in the study of human anatomy—of anatomy, not as it lies in dust and ashes, but as a living entity, the crown and summit of nature, the greatest thing as far as we know that has been created, on this planet at all events, if not in the whole universe.”

The appointment of a radiologist as Radiological Demonstrator in Living Anatomy at the Birmingham University marks the tendency in progressive medical schools, not only to acquire in the department of anatomy a modern X-ray installation, but to appoint a competent radiologist as a member of the teaching staff.

The student is taught to appreciate the radiological appearances of the normal structures in the living body while he is actively engaged in his dissections, and this correlation will subsequently enable him the more readily to discern the signs of pathology. Many of the most glaring instances of faulty interpretation of radiographs, sometimes followed by dire consequences, have been due to ignorance of the radiographic appearance of the normal. Thus the shadow of the hyoid bone projected against the mandible has been interpreted as a sarcoma of the mandible; the dark shadow of the pharynx with the characteristic outline due to the epiglottis has been interpreted as an abscess cavity having sinuses leading from it. Moreover, the keen interest shown by medical students during the radiological demonstration of the movements of the thorax and its contents, and the passage of opaque media through the alimentary tract, proves that the practice materially stimulates the study of human anatomy and physiology. With the perfection of reasonable methods of cinemato-radiography this teaching of the human anatomy of the living will be still further advanced. An interesting account of one of the latest forms of cinemato-radiography is given by R. Janker.²³

APPARATUS.

Each year sees some improvement in the materials and apparatus used in radiography. The trend of improvements during the year has been towards greater output, with its consequent reduction in the time of exposure; and the provision of shock-proof apparatus. The Levy² rapid intensifying screen enables radiographs to be taken in one-third to a quarter of the time required by other screens. Unfortunately the screen continues to glow for a considerable time after a heavy exposure, and if a new film is left in contact it will be fogged by the after-glow. Provided this feature is fully appreciated when they are used, the screens will secure good contrasty radiographs with a marked reduction of exposure. An account of the special advantages of the screens in practice is given by N. S. Finzi.³

ANTE-NATAL RADIOGRAPHY.

Radiography affords the most accurate methods of determining the size and shape of the female pelvic canal, and the number of obstetricians relying on this method is steadily increasing. The radiographic has a number of important advantages over all other methods, for not only can accurate pelvic dimensions be determined with little or no discomfort to the patient, but also the position, size, and shape of the fetus. Unsuspected abnormalities are in this way not infrequently discovered which might later have placed the life of the mother in danger and occasioned much worry to the practitioner. So vital is the discovery of these abnormalities that, even if the percentage of abnormalities was much smaller than it is, the ease and readiness by which they

can be detected radiographically will ultimately result in the method being used in all cases.

R. E. Roberts⁴ has published a very interesting account of his findings in 600 selected cases of pregnancy. His excellent series of radiographs of pregnant women showing fetal abnormalities should convince the most conservative clinician of the value of such radiography. He classifies the reasons for the X-ray examinations into the following groups: (1) Differential diagnosis between pregnancy and tumour; (2) Ascertainment of the age of the foetus; (3) Determination of the position and presentation of the foetus; (4) Assessment of maternal pelvic measurements; (5) Investigation of disproportion; (6) Diagnosis of multiple pregnancy; (7) Diagnosis of extra-uterine pregnancy; (8) Investigation of the cause of hydramnios, with special regard to foetal abnormalities; (9) Diagnosis of intra-uterine death.

At the Centenary Meeting of the British Medical Association, L. A. Rowden⁵ demonstrated the radiographic method of pelvimetry devised by Roberts and himself. From a long experience in this type of radiography he is of the opinion that the pelvis of every woman should be measured soon after marriage. A full account of the method is given in a previous communication. George E. Moore⁶ reviews the development of radiographic pelvimetry and describes a simple method which he has devised.

The paper by D. M. Lindsay⁷ on the radiographic findings in the late months of pregnancy illustrates the significance of experience in the interpretation of ante-natal radiographs. In a paper on the radiographic diagnosis of early pregnancy, A. Jerome Thomas⁸ states that pregnancy can be diagnosed radiographically as early as the sixth week, but his descriptions and illustrations are not convincing.

BONES AND JOINTS.

Plates LVIII-LXIX are taken from *The Radiology of Bones and Joints* by the reviewer.⁵⁰

R. Watson Jones and R. E. Roberts,⁹ in a paper on *pathological calcification and ossification* in relation to Leriche and Policard's theory, explain the causation of calcification, decalcification, and ossification. They explain that Leriche and Policard consider that decalcification is brought about by hyperæmia, whereas a reduced blood-supply causes sclerosis; diminution of vascularity of fibrous tissue and excess of calcium causes calcification; and fibroblasts give rise to bone in any situation. The theory is a very attractive one and attempts to explain in a very simple manner the many problems of bone pathology, but it has not been universally accepted—indeed, there are many problems which do not appear to be solved by it.

C. E. Gaitskell¹⁰ publishes the radiographs of the feet of a woman aged 59 years which show osteochondritis of the head of the 2nd metatarsal bone on both sides (*Köhler's disease*). The interesting feature is that the radiographs which he took one year previously showed no evidence of bone pathology. The records of such changes commencing at so late an age are very few.

In a description of a case of *hypodermolithiasis*, E. W. Twining and W. Addey¹¹ publish a radiograph showing a deposit of calcium around the extremity of the terminal phalanges. R. E. Roberts⁹ shows a similar condition in the fingers of a patient with so-called Raynaud's disease.

W. E. Nelson, W. M. Dougherty, and A. G. Mitchell¹² in a paper on *scurvy*, state that they consider subperiosteal hæmorrhage as one of the most characteristic signs of the disease, but that these hæmorrhages are often missed on radiographic examination because they cannot be demonstrated until healing has commenced and calcium has been deposited beneath the periosteum.

PLATE LVIII

HÆMANGIO-ENDOTHELIOMA OF THE RIBS

(JAMES F. BRAILSFORD)



Note the expansion of the ribs and the coarse bony septa throughout the tumour. Similar smaller tumours are shown in the other ribs.

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PLATE LIX

OSTEOPOROSIS IN HYPERPARATHYROIDISM

(R. M. BEATH and FRANK MONTGOMERY)



Note the irregular appearance of the cortex of the phalanges, the cyst-like changes in the 2nd metacarpal, and the cancellous tufts of the terminal phalanges.

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PLATE LX

OSTEOPOROSIS IN RENAL RICKETS

(JAMES F. BRAILSFORD)



Fig. A.—Skiagram of skull, showing the multiple circumscribed areas of rarefaction. A similar appearance may be produced by xanthomatosis, osteomalacia, and multiple myeloma.

PLATE LXI

OSTEOPOROSIS IN RENAL RICKETS—*continued*

(JAMES F. BRAILSFORD)

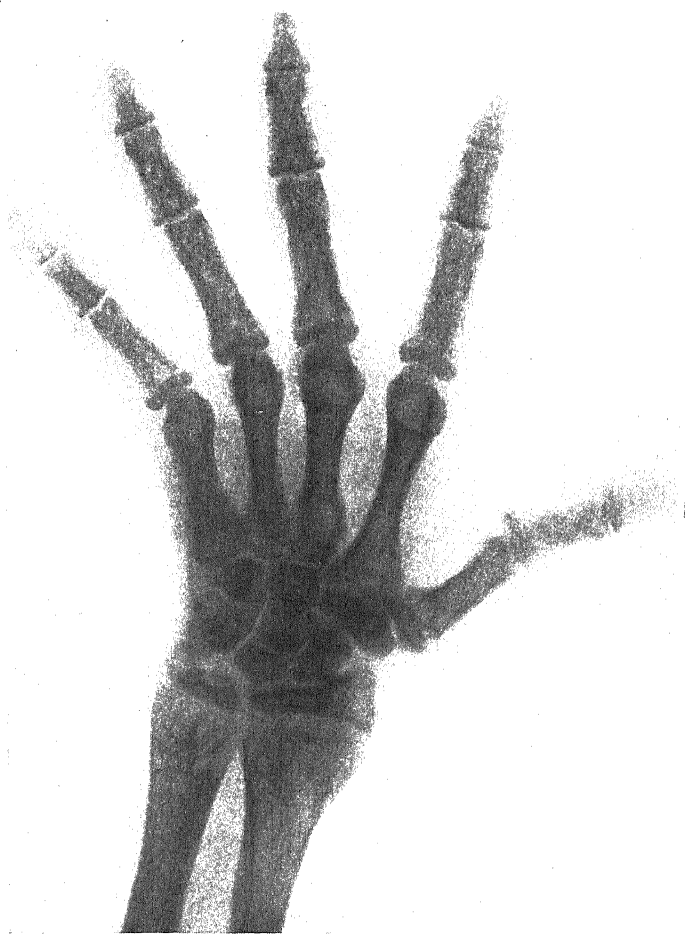


Fig. B.—Skilgram of the hand of the same patient. Note the deep osteoid metaphysial region of the radius and ulna, and the absence of compact cortical bone.

PLATE LXII

CHARCOT'S HIP-JOINT (HYPERTROPHIC TYPE)

(JAMES F. BRALLSFORD)



Note the 'wearing away' of the head and neck of the femur, the massive new bone formation over the roof of the acetabulum, and the deposit of calcium in the soft tissues of the thigh.

PLATE LXIII

HYPOTHYROIDISM

(JAMES F. BRAUSFORD)

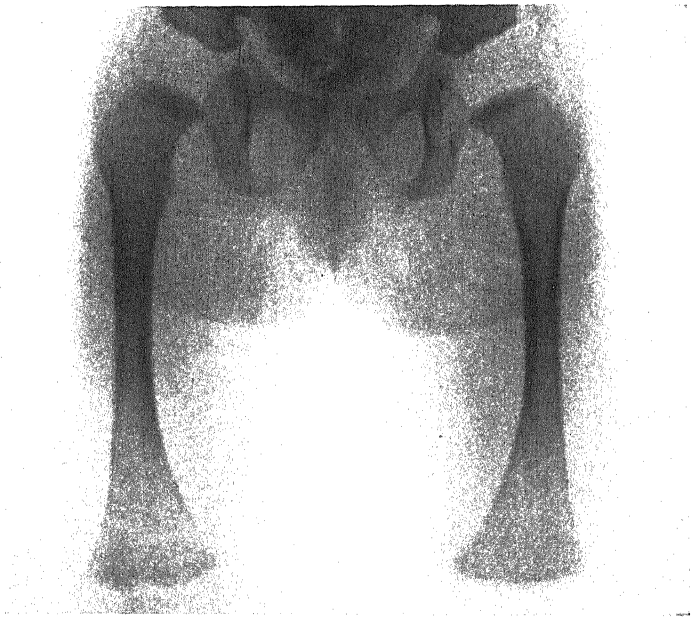


Fig. A.—Skiagram showing delayed ossification of the capital femoral epiphyses in a girl aged three years.

PLATE LXIV

HYPOTHYROIDISM—continued

(JAMES F. BRAILSFORD)



Fig. B.—Skiagram of same girl at the age of ten years. Note the fragmentation of the femoral capital epiphyses—an appearance simulating Perthes' disease.

PLATE LXV

SIMPLE CYST IN THE NECK OF THE FEMUR

(JAMES F. BRAILSFORD)

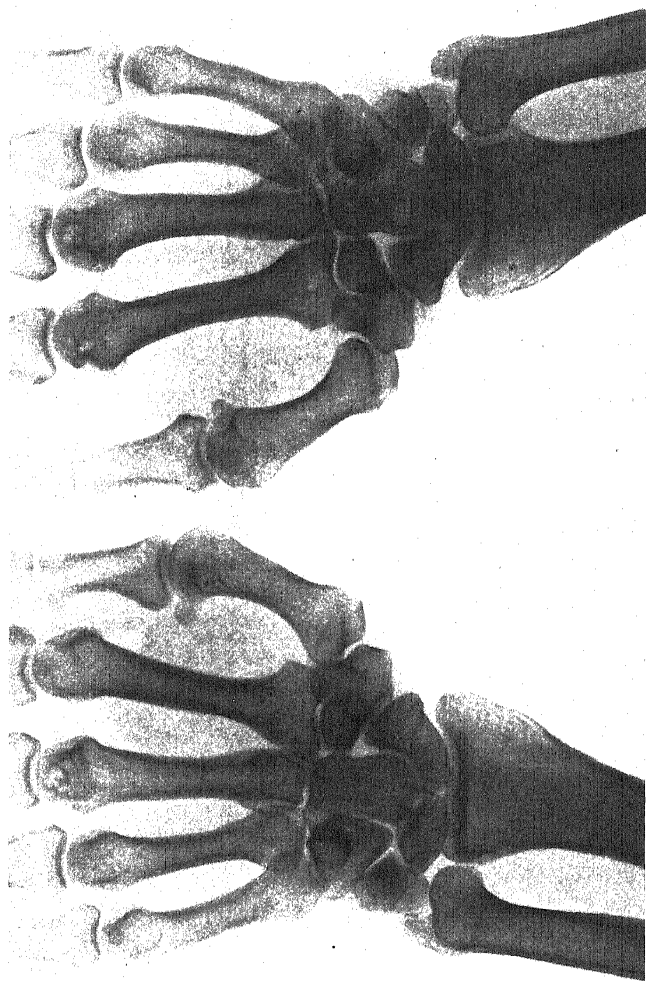


Fig. A.—Appearance of cyst when first discovered.



Fig. B.—After surgical evacuation of the cyst.

PLATE LXVI
TRAUMATIC CYSTS IN BONES
(JAMES F. BRAILSFORD)



Showing traumatic cysts in the bones of the hands and wrists of a compressed-air drill worker. Note the cystic changes in the carpal bones and heads of the metacarpals.

PLATE LXVII

CALCIFIED RETROPHARYNGEAL AND CERVICAL
TUBERCULOUS ABSCESSSES

(JAMES F. BRAILSFORD)

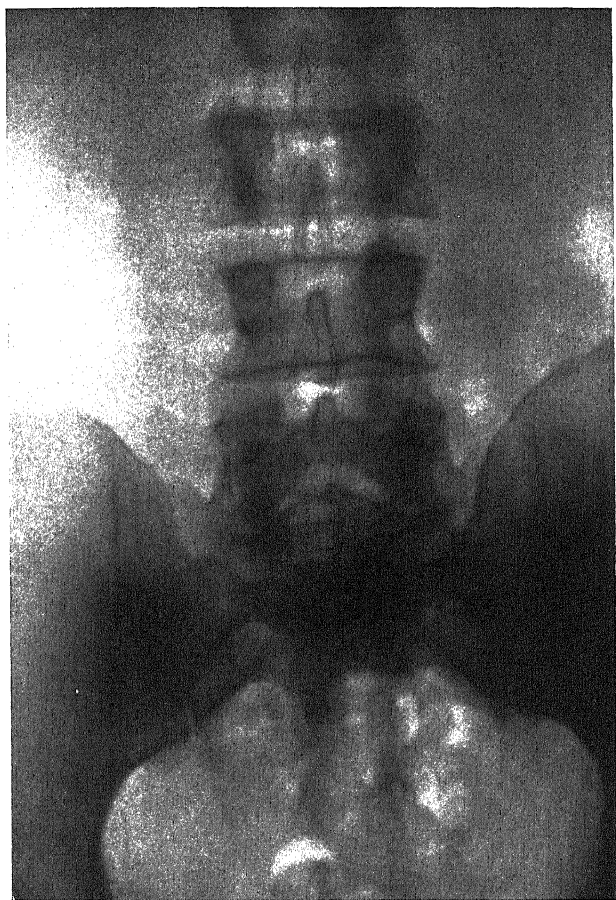


Skigram showing a deformity of the upper three cervical vertebrae due to old tuberculous caries.
Note the spindle-shaped calcified abscesses lying in front of the vertebrae.

PLATE LXVIII

ANGIOMA OF THE THIRD LUMBAR VERTEBRA

(JAMES P. BRAILSFORD)



Note the coarse trabeculation of the body and processes of the 2nd lumbar vertebra compared with the normal appearance of the fourth and fifth. The appearance resembles that of the fibrous type of osteitis deformans (Paget's disease).

PLATE LXIX

CHALKY BONES (ALBERS-SCHÖNBERG'S DISEASE)

(JAMES F. BRAILSFORD)



Note the absence of cortical compact tissue, linear accretions of dense bone at the extremities of the long bones, and the cracks in the proximal extremities of the phalanges which are perpendicular to the epiphyseal line.

Fractures of the upper end of the femur in the aged are classified by J. N. Jacobson¹³ into the following groups: (1) Subcapital fracture of the neck; (2) Transcervical fracture; (3) Trochanteric fracture; (4) Subtrochanteric fracture; (5) Avulsion fracture of the trochanter major.

S. L. Mucklow¹⁴ contributes notes on two cases of *osteogenesis imperfecta tarda* in a woman aged 33 years and her brother aged 21 years. His excellent radiographs show that the shafts of the long bones are reduced to the form of slender rods of compact tissue, while the extremities are of normal size but consist of rarefied coarse cancellous tissue. The pelves are atrophied and distorted by pressure.

Bone changes in Hodgkin's disease have been recorded in a number of cases, but the case published by H. Courtney Gage¹⁵ illustrates the consolidation of the diseased bone, the upper end of the diaphysis of the humerus, following radiation of the area by X rays.

Paul Cave¹⁶ has contributed two interesting papers on *osteoplastic metastases*. He states that a review of reported cases indicates that these are chiefly derived from primary neoplasms of the prostate and to a lesser extent from the breast, and that metastases from the thyroid are invariably osteoclastic—findings which are in support of the theory that lymphatic dissemination produces osteoplastic metastases, while hamatogenous spread results in osteoclastic changes, mixed types being caused by dissemination via both routes.

Pneumoradiography of the knee-joint, a technique designed to show internal derangements and injuries, has been used by several workers. J. Oberholzer¹⁷ gives an account of his methods in which he injects **Abrodil** or **Perabrodil** with CO₂.

Amongst the best radiographic books of the year is that by Schmorl and Junghanns.¹⁸ This book gives an account of the *pathological lesions of the vertebrae* found on section of the vertebrae removed from some 10,000 post-mortem subjects. The book is illustrated throughout with a large series of fine photographs and radiographs of the sectioned vertebrae: the photograph and radiograph of each specimen, reduced to the same scale, are printed side by side. This permits of ready comparison. The detail in the radiographs is obviously better than can be obtained by radiography of the vertebrae of the living, but the changes shown in the various pathological lesions will be the more readily appreciated and understood by the student after studying these illustrations. Radiographs of most of the pathological conditions affecting the spine are published in the book, with a description of the essential features.

J. D. Camp, A. W. Adson, and J. J. Shugrue, in a paper¹⁹ on the roentgenographic findings associated with *tumours of the spinal column, spinal cord, and associated tissues*, describe the radiographic appearances produced by these tumours. They state that spinal neurofibromata, being benign and encapsulated, cause erosion of the bone by direct pressure; the earliest sign being erosion and thinning of the mesial border of one or both of the vertebral pedicles; finally the contour of the bodies is altered and the intervertebral foramen may be enlarged. Descriptions are also given of the changes produced by endotheliomata, ependymal-cell gliomata, chondromata, and fibrochondromata.

Lumbar and Sciatic Pain.—A discussion on the radiographic findings in the investigation of these conditions was opened by the reviewer²⁰ at the Centenary Meeting of the British Medical Association. He pointed out that the radiographic investigation should always include radiographs of the lumbar and sacral spine, pelvis, and hip-joints, and that these should be supplemented

by radiographs of other organs or structures according to the indication of the physician. Low back pain may be due to congenital or postural deformities of the lower spine or to pathology of the female generative organs. In individuals harbouring a focus of chronic sepsis, progress towards recovery following trauma is much slower than in healthy persons. In a fair proportion of cases of lumbar and sciatic pain, toxic absorption from the colon may be responsible, while the prevalence of arthritis of the lower spine and hip-joints in women is probably due largely to sepsis of the genito-urinary system. The importance of the radiographic appearances of these areas following trauma was indicated in cases of claim for compensation.

By far the most common cause of low back pain is absorption from some septic focus. An important and common focus which is generally locally symptomless and unsuspected by the patient is the chronic abscess at the apices of infected teeth. The removal of the septic foci was frequently followed by rapid alleviation of the symptoms which had failed to respond to the exhibition of various forms of 'physical medicine'. It is most important for the patient, whose health is our first and chief care, that the doctor in attendance should be acquainted with the presence of any such focus of danger to health. The dental surgeon may know of it; he may have knowingly root-filled a septic tooth, believing that it could have no influence on the health of the patient or because he considered it of importance in holding a denture, or because the patient expressed a desire to keep it and the dental surgeon has been persuaded against his better judgement. But when the acute lumbago or sciatica or more grievous malady resulting from it comes along, this evidence is not in the hands of the doctor, and the patient, having no local symptoms, does not think of the teeth as a cause. Further, if the dental surgeon has taken radiographs, the patient and doctor are apt to conclude that these were satisfactory and interpreted correctly, and consequently that any septic focus has been effectively dealt with. Unfortunately only too often the radiologist discovers that this is not the case. Examples were cited in which definite septic foci and malignant disease of the bones of the pelvis and spine were detected, the demonstration of the latter being a strong argument against any severe operative treatment of the former. These findings indicate the need for an independent unbiased opinion on the radiographic appearance.

R. M. Beath²¹ discussed the problem from the point of view of lesions of the urinary tract, and illustrated many cases of lumbar pain in which the origin had been effectively traced by radiography to the genito-urinary system. He described some of the results of a study of 1500 cases which he had undertaken in collaboration with A. Fullerton.

H. K. Graham Hodgson²² is of the opinion that chronic septic foci in the accessory nasal sinuses accounts for a certain number of cases of backache; that radiology, if applied in a reasonable and accurate manner is very valuable in the search for this; and that its value has not been properly appreciated. He described his technique for sinus radiography.

In the opinion of R. S. Paterson,²¹ gastric and duodenal ulcer and carcinoma give rise to lumbar and sciatic pain, especially when adherent to the pancreas. The gall-bladder was a more frequent cause. Visceroptosis caused lumbar pain especially in multiparæ. Appendicitis was perhaps the commonest condition of the alimentary tract associated with lumbar pain. This occurred especially when the appendix was retrocæcal and when adhesions were present. Other causal lesions were carcinoma of the colon, colitis, and diverticulitis. Stress was laid on the importance of complete clinical examination before recourse to radiography.

R. E. Roberts²¹ illustrated many cases of Paget's disease and secondary carcinoma of the lumbar vertebræ and pelvis, the discovery of which had been made on radiographic investigation of cases of lumbar and sciatic pain.

Gilbert Scott²¹ divided arthritis in this region into two types: (1) Spondylitis, which occurred in the young and which was inflammatory; and (2) Spondylosis, which was degenerative and which occurred later in life. He had found that in these cases of 'spondylitis adolescens' the sacro-iliac joint was always infected and that in spondylosis it was always ankylosed. He considers that infection of the sacro-iliac joint is primary and causal.

THE THORAX.

The Breast.—W. Vogel,²⁴ in a paper on radiography of tumours of the female breasts, illustrates the appearance produced by scirrhus carcinoma, adeno-carcinoma, diffuse carcinoma, chronic mastitis, and single cysts. The technique which he describes may be of value in certain cases where the clinical evidence is indefinite.

The Lungs.—Stanley Melville²⁵ said it was as big a mistake to diagnose *pulmonary tuberculosis* solely on X-ray evidence as to neglect to take the radiograph into account at all. The X-ray film would show definite infiltration at quite an early stage, often before there were clinical signs, and at a later stage, when the physical signs were present, the X-ray would show much more extensive disease than could be demonstrated by physical examination. If the X-ray evidence was consistently negative for some months, pulmonary tuberculosis might be regarded as absent.

R. A. Young²⁶ pointed out that radiology has attained an important position not only in diagnosing pulmonary tuberculosis but in estimating its extent and treating it, and that the more clinical information the radiologist has, the more help he could give in explaining what might be obscure. Radiography, he stated, gave more help in localization than in diagnosis and in estimating the age and character of lesions; its information on their quiescence or activity was less certain, but it gave valuable evidence on the state of cavities, effusion and displacement of the heart, trachea, or diaphragm, and of senile tuberculosis, which was more common than was generally recognized.

(See also TUBERCULOSIS, PULMONARY.)

F. G. Chandler²⁶ spoke of the *value of lipiodol* in chest radiography. He said it was always better to operate on an incurable case than to leave a curable one alone, and exploratory thoracotomy must be added to the diagnostic procedures. D. L. S. T. Burrell²⁶ spoke of the use of radiology in collapse therapy. J. Duncan White²⁶ on lipiodol radiography. He stated that preliminary radiographs were essential and that he preferred the supra-glottal route, but if the patient was nervous the injection was best made through the crico-thyroid membrane. If the bronchoscope was used, then it could be put in at the same time. The method was invaluable in bronchiectasis. The appearance of pulmonary abscess might be confused with those of bronchial stenosis or neoplasm. He stressed the importance of the clinician supplying the radiologist with essential clinical features.

(See also BRONCHIECTASIS, ATELECTATIC, IN CHILDREN.)

E. W. Twining²⁶ said there was a distinct tendency to over-softness and under-exposure in order to record quite hypothetical infiltration. Many workers emphasized the importance of small shadows, holding that they often indicate early tuberculosis. He said the smaller the lesion, the less likely it was to be early.

J. V. Sparks²⁶ illustrated the radiographic appearance of *silicosis* and *asbestosis*. He pointed out that, although the visible changes in the latter

were few compared with those of silicosis, the condition was not necessarily less serious, for the fibrosis left little intermediate tissue undamaged.

J. V. Sparks and F. G. Wood, in a paper²⁷ on the radiographic appearances of the lungs in *chronic bronchitis and emphysema*, state that thickening of the pleura is most marked at the base, that adhesions may be present, and that the movements of the diaphragm may be restricted and its outline irregular. The costo-phrenic angles may be obliterated. The linear striæ may be increased, but not in proportion to the physical signs. He tabulates the signs of emphysema given by Podkaminsky: (1) Increased clarity of the lung fields; (2) Lowering of the diaphragm; (3) Widening of the costo-phrenic angles; (4) Increase in the intercostal space so that the ribs are more horizontal; (5) Enlargement of the retrosternal space, which becomes more translucent in a lateral view.

J. F. Bromley²⁸ has published the details and radiographs of *multiple hydatid cysts in the thorax* of a girl aged 16. One large cyst is illustrated against the anterior thoracic wall. He states that only 2 per cent of eosinophils were present in the patient's blood.

The Heart.—Radiography in the diagnosis of *congenital heart disease* is of service to the clinician in a small percentage of cases only. The clinical signs are as a general rule more prominent and instructive. The percentage of radiographs of value for the recognition of these lesions increases with each age period towards adult life.

An interesting article on congenital diseases of the heart has been contributed by Peter Kerley.²⁹ In this article he classifies the cases into three groups: (1) Cases in which there is no admixture of arterial and venous blood; (2) Cases with an arterial venous shunt without cyanosis or with late cyanosis; (3) Cases with a venous arterial shunt and definite cyanosis.

Group 1.—Dextrocardia, idiopathic heart hypertrophy, bicuspid aortic valve, right-sided aorta, co-arcetation of the aorta, and fetal endocarditis. He refers to a case of right-sided aorta in an elderly man described by Schinz which was associated with dysphagia due to compression of the œsophagus by the abnormal position of the left subclavian artery. In co-arcetation of the aorta the latter is constricted in the region of the ductus arteriosus; consequently the pressure in the arteries of the upper half of the trunk is very high and in the lower half very low. Radiographically the condition shows: (a) Dilatation of the first part of the aorta; (b) Defect in the aortic arch; (c) Unusual clarity of the bifurcation of the trachea; (d) Characteristic localized erosion of the inferior borders of the ribs; (e) Enlarged left ventricle.

Group 2.—Patent ductus arteriosus, defect in the aortic septum, patent foramen ovale, patent interventricular septum. In patients with patent ductus arteriosus the pulmonary artery and both the ventricles are enlarged. If two radiographs are taken under identical conditions, one in quiet inspiration and one in forced expiration, it will be seen that the shadow of the pulmonary artery has decreased in size in the picture taken during expiration. In patients with a patent foramen ovale the heart may show enlargement to left and right, dilatation of the pulmonary artery, gross enlargement of the right hilar shadow, and increased striæ in the lung fields due to wide coarse vessels. Also absence of aortic shadow. Radiographs of patients with a patent interventricular septum may show hypertrophy of the right heart, synchronous pulsation of the right and left borders of the heart, and widening of the hilar shadows.

Group 3.—Pulmonary stenosis, cor triloculare, Eisenmenger's complex, Fallot's tetralogy, patent interventricular septum with pulmonary atresia or transposition of the arterial trunks. Fallot's tetralogy consists of: (a) Pulmonary

stenosis; (b) Ventricular septum defect; (c) Dextro position of the aorta; (d) Hypertrophy of the right ventricle.

Kerley refers to Bedford's description of the radiographic appearances: "There is a cavity in the region of the pulmonary artery due to hyperplasia of the vessel, though the conus arteriosus at a lower level may be dilated and there is visible dextro position or enlargement of the ascending aorta, and the right ventricle pushes out to the left and displaces the apex upwards."

ALIMENTARY TRACT.

The most important contribution during the year to the literature on this system is A. E. Barclay's book, *The Digestive Tract*.³⁰ The book contains the summary of the author's experience during many years as a radiologist. It is one which will repay careful study by any practitioner who may be called upon to express an opinion on the value of radiography of the alimentary canal.

If one had to make a criticism, it would be that insufficient stress has been placed upon a thorough *preliminary radiographic examination* prior to the introduction of any opaque material. The significance of the preliminary investigation is illustrated by the account which came to the writer's attention of a fluoroscopic examination of the œsophagus of a man who was considered to have swallowed his false teeth. At the fluoroscopic examination a shadow was seen on a plane with the œsophagus, and an operation, which proved fatal, was performed just prior to a relative finding the dental plate at the patient's home. In another case the patient complained of pain in the region of the upper end of the œsophagus. An examination of the area by an aural surgeon failed to detect any abnormality. Radiographic examination during the swallowing of a fluid suspension of barium and thick barium paste was also unsuccessful. The diagnosis was made from a preliminary radiograph on which a very thin plate of bone was detected. When removed it was found to be the thin triangular plate of bone from the sternum of a fowl.

T. W. Adams, D. J. Clarke, J. M. Lees, M. S. Pembrey, and R. S. Vine,³¹ in a paper on the *influence of muscular work upon the movements of the stomach*, demonstrated by radiography the truth of the statement that hard muscular work delays the passage of food through the stomach.

E. D. Gray³² has demonstrated a potential *pharyngeal diverticulum* in 6 patients out of 250 consecutive cases examined for the special purpose of its discovery. The age incidence was between 49 and 65 years. Only one patient complained of symptoms referable to the pharynx. He states that the deformity appears as a pointed barium-filled projection from the posterior pharyngeal wall at the level of the cricoid, which presents in the lateral view a horizontal lower border and an oblique upper border, and in the antero-posterior view a horizontal streak extending across the pharynx. The shape and position of the recess suggests that it is due to herniation of the pharyngeal mucous membrane between the circular and oblique fibres of the crico-pharyngeus, and that it is therefore a potential pharyngeal diverticulum. It is the possible site for the impaction of a foreign body.

J. V. Sparks³³ has illustrated the radiographic appearance of a *pharyngeal diverticulum containing a neoplasm*. The patient was a man of 59 years. He had had difficulty in swallowing, with the production of a swelling in the neck, for thirty years. Recently regurgitation with blood and complete obstruction of the œsophagus had been the striking clinical features. The pouch took at least half a pint of fluid to fill. The patient's father, aged 75, and a paternal uncle, aged 75, died of pharyngeal pouch complications, and a cousin still alive had a pouch.

R. A. Kemp Harper,³⁴ in the record of a case of *pedunculated papilloma of*

the stomach, publishes radiographs which show a rounded filling defect in the pre-pyloric area of the stomach. The patient had had attacks of hæmatemesis. At operation the stomach appeared normal, but the first part of the duodenum was distended by a rounded irregular mass in its interior. The mass was mobile and was squeezed through the pylorus into the stomach. A wide opening was made through the anterior wall of the stomach and a large pedunculated mass exposed, its pedicle being attached to the lesser curvature. In another paper³⁵ this author describes a case of *carcinoma of the stomach* of a child 11 years of age.

A. Bruce MacLean³⁶ describes a *gastro-ileal reflex in chronic appendicitis*. He had examined 300 cases of chronic appendicitis radiographically, and 40 of these had been operated on and the diagnosis confirmed. The reflex is elicited by giving ordinary food as an excitant meal four hours after the barium meal and noticing the amount of barium in the colon one hour later. Chronic appendicitis causes delay in the filling of the colon in about 50 per cent of cases.

THOROTRAST.

During the year a number of papers have been contributed on the results of intravenous injection of thorotrast for the demonstration of gross lesions of the liver and spleen. Thorotrast* is a colloidal solution of thorium dioxide which when injected into the circulation is fixed in the reticulo-endothelial system and renders these structures relatively opaque to X rays; consequently the shape of the liver and spleen can be shown on radiographic films. Any gross lesion of these structures will be revealed as areas of transparency. The drug has been administered for the demonstration of malignant metastases, cysts, abscess or cirrhosis of the liver, and for the localization of tumours within the abdomen.

L. G. Erickson and Rigler³⁷ have reported on the findings in 82 cases. They state that they have found the clinical application of the method to be surprisingly broad and useful, and that at the present time it is being used as a routine procedure pre-operatively for all cases of malignancy of the alimentary tract in order to rule out metastases. They point out that if at the first examination following administration of the drug no metastases are evident, at a later date, owing to the fact that the thorium is only very slowly eliminated, a further radiographic examination may reveal metastases which have developed. Further, they state that to the clinician cirrhosis of the liver is one of the most difficult diseases to diagnose in the early stages, and it is in the early stages that visualization of the liver and spleen with thorotrast is of the greatest help. W. H. Dickson³⁸ supports these views of the value of thorotrast in the diagnosis of cirrhosis of the liver.

In spite of this evidence the reviewer is inclined to agree with H. V. Tighe when he states³⁹ that "in borderline cases I would consider a laparotomy a more justifiable procedure than the use of thorotrast", for it has been pointed out by P. H. Whitaker, T. B. Davis, and F. Murgatroyd,⁴⁰ R. Lewisohn,⁴¹ Shute and Davis, Ettore Liverani,⁴² and others that, following the injection of this drug, degenerative changes occur in the liver cells, thorium being slightly radio-active and only very slowly eliminated.

Accounts have been published of cases in which thorotrast has been injected prior to operations at which simple lesions such as abscess, hydatid cysts, etc., have been found. Such a procedure in these and in cases of suspected cirrhosis of the liver appears to be unjustifiable owing to the risk of pathological changes consequent upon the injection and fixation of the thorium. Even

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when used for the detection of metastases the possibility of missing the early deposits would appear to be great. Further contributions on this subject have been made by A. Capua,⁴³ K. Radonice,⁴⁴ and K. Herman.⁴⁵

Smaller quantities of thorotrast, 8 to 15 c.c., have been injected into the common carotid artery (without the possibility of dangers of the larger doses necessary to demonstrate the liver and spleen) for the purpose of demonstrating lesions of the larger vessels of the brain and the localization of brain tumours. An account of these procedures is given by Moniz and his colleagues.⁴⁶

CHOLECYSTOGRAPHY.

In the opening paper⁴⁷ at a Meeting of the Royal Society of Medicine, the reviewer made the following points:—

1. No branch of radiology requires more careful attention to technique and detail than gall-bladder radiology.

2. The X-ray examination should always include: (a) A preliminary examination; (b) Cholecystography; (c) Barium meal, in this sequence.

3. A number of gall-stones can be shown on the preliminary radiograph, and a further number on the cholecystograph, but there still remains a proportion which cannot be seen by X-ray examination. The greater the care taken in technique, the smaller will be the number of gall-stones not indicated.

4. The radiographic demonstration of gall-stones does not necessarily mean that the lesion causing the patient's illness has been discovered. Gall-stones may exist without causing marked symptoms. They may produce symptoms which are atypical.

5. The dye can be administered: (a) By mouth; (b) Intravenously. The former is now the best routine method of examination, though the latter still remains the more accurate.

6. Non-filling of the gall-bladder indicates in about 96 per cent of cases a pathological condition of the gall-bladder, often accompanied by stones, though these may not be shown on the radiograph.

7. Poor filling of the gall-bladder on repeated examination also indicates a pathological condition of the gall-bladder.

8. A good gall-bladder shadow which is normal in shape, size, and position, uniform in outline and density, and which contracts after a meal to a much smaller size, in a high percentage of cases indicates a normal gall-bladder. A small proportion of such gall-bladders may be diseased, and may even contain a small collection of stones.

9. Any abnormality in the area of the gall-bladder before or after it has been filled with dye should be investigated by further radiographs taken according to the type of abnormality seen.

10. It has been demonstrated that a large collection of stones in the gall-bladder can be passed into the intestine by way of the ducts.

11. Complete gall-bladder radiology enables us to give a fairly accurate opinion as to the condition of the gall-bladder.

Stanford Cade⁴⁷ reviewed the findings of 1018 cholecystographs carried out at the Westminster Hospital. He considers that the intravenous method is the method of choice.

S. Cochrane Shanks⁴⁷ advises the use of the oral method. Obstructive jaundice he regards as a contra-indication.

John H. Anderson and O. A. Marxer⁴⁸ contribute an interesting article on a cumulative method, and draw the following conclusion from its use: (1) There are certain dangers in regarding as pathological a gall-bladder which fails to give a shadow after a single cholecystograph, oral or intravenous; (2) Eleven cases are quoted in which cumulative filling by the oral route was

carried out; (3) The method employed gave added diagnostic information and did not increase the reaction on the part of the patient.

George Levene⁴⁹ reviews the radiographic findings and points out the significance of tenderness of the dye-filled strawberry gall-bladder.

REFERENCES.—¹*Brit. Jour. Radiol.* 1933, Jan., 2; ²*Ibid.* Feb., 85; ³*Ibid.* 103; ⁴*Brit. Med. Jour.* 1932, Oct. 1, 621; ⁵*Brit. Jour. Radiol.* 1932, Aug., 657; ⁶*Surg. Gynecol. and Obst.* 1933, Jan., 101; ⁷*Lancet*, 1933, i, 106; ⁸*Radiology*, 1932, Aug., 99; ⁹*Proc. Roy. Soc. Med.* 1933, May, 853; ¹⁰*Brit. Jour. Radiol.* 1932, Nov., 813; ¹¹*Ibid.* 1933, April, 240; ¹²*Jour. Amer. Med. Assoc.* 1933, July 1, 14; ¹³*Brit. Jour. Radiol.* 1933, Jan., 39; ¹⁴*Ibid.* May, 294; ¹⁵*Ibid.* 297; ¹⁶*Ibid.* Feb., 69; ¹⁷*Zentralbl. f. Chir.* 1933, June 30, 1532; ¹⁸*Die gesunde und kranke Wirbelsäule im Röntgenbilde*, 1932, Leipzig, Georg Thieme; ¹⁹*Surg. Gynecol. and Obst.* 1933, June, 512; ²⁰*Brit. Med. Jour.* 1932, Nov., 5, 827; ²¹*Ibid.* i, 265; ²²*Ibid.* 1933, i, 5; ²³*Deut. Zeits. f. Chir.* 1933, April, 52; ²⁴*Arch. f. klin. Chir.* 1932, Aug., 618; ²⁵*Brit. Med. Jour.* 1932, ii, 283; ²⁶*Ibid.* 363; ²⁷*Lancet*, 1932, ii, 1419; ²⁸*Brit. Jour. Radiol.* 1933, April, 237; ²⁹*Ibid.* May, 257; ³⁰*The Digestive Tract*, 1933, Cambridge University Press; ³¹*Brit. Jour. Radiol.* 1932, Nov., 824; ³²*Ibid.* Aug., 640; ³³*Ibid.* 1933, April, 233; ³⁴*Ibid.* 1932, Nov., 811; ³⁵*Ibid.* 1933, May, 299; ³⁶*Brit. Med. Jour.* 1932, ii, 1055; ³⁷*Jour. Amer. Med. Assoc.* 1933, June 3, 1758; ³⁸*Canad. Med. Assoc. Jour.* 1932, Aug., 125; ³⁹*Irish Jour. Med. Sci.* 1933, May, 203; ⁴⁰*Quart. Jour. Med.* 1933, Jan., 49; ⁴¹*Surg. Gynecol. and Obst.* 1932, July, 68; ⁴²*Policlinico*, 1932, Aug. 1, 373; ⁴³*Ibid.* Oct. 15; ⁴⁴*Presse méd.* 1932, Nov. 19, 1736; ⁴⁵*Wien. klin. Woch.* 1932, Sept. 9, 1117; ⁴⁶*Röntgenpraxis*, 1932, iv, 90; ⁴⁷*Proc. Roy. Soc. Med.* 1932, June, 1249; ⁴⁸*Brit. Med. Jour.* 1932, ii, 40; ⁴⁹*New Eng. Jour. Med.* 1932, Sept. 8, 443; ⁵⁰*The Radiology of Bones and Joints*, J. and A. Churchill, London.

X-RAY AND RADIUM THERAPY. (See also CANCER, RADIUM TREATMENT OF; RADIOTHERAPY IN GYNÆCOLOGY.) James F. Brailsford, M.D.

Inflammatory Conditions, etc.—J. H. Douglas Webster,¹ in a paper on X-radiation of inflammatory conditions, stated that he found it most useful in small doses in boils, carbuncles, whitlow, erysipelas, and many deep-lying inflammations. The radiation should be given without previous surgical interference. Actinomycosis responded well. In tuberculous conditions it is important to avoid over-dosage, which might set free otherwise immured bacilli, one-sixth of an erythema dose at weekly or longer intervals being advisable. Obstinate chronic sinusitis should also be treated by X rays; and two or three mild deep X-ray applications, with or without preliminary injection of bismuth oil or paste, would often heal a persistent ischio-rectal abscess.

Many chronic inflammatory skin diseases gave the most striking success with radiation. Acne and many eczemas respond rapidly. Chronically enlarged and septic tonsils were extremely radio-sensitive, and a few X-ray treatments might completely clear up the unhealthy tonsil in the child. Excellent results could also be obtained in adults where there was not much fibrosis.

Good results are also claimed in gastric and duodenal ulcer. It relieved pain and tenderness, reduced gastric acidity, and improved weight and appetite. Hæmorrhage might be lessened by splenic radiation. The result of X-ray treatment of various forms of keratitis had been almost universally excellent, with relief from pain after a few applications. This writer also reported good results in irido-cyclitis and a few cases of ulcer. Hope Fowler said radiation inhibited the spasms of whooping-cough.

Leukæmia.—G. Harrison Orton² points out the importance of small dosage in the X-ray treatment of leukæmia. The initial dose should be very small. Cases of myelogenous leukæmia are less likely to react adversely in the way of constitutional disturbances than the chronic lymphatic cases. He says that in chronic lymphatic leukæmia large, or even moderate, doses are not only not advisable, but may be actually dangerous, and that, in view of the marked effect on the blood of very small doses of X rays, large doses are quite unnecessary. He maintains that the symptomatic improvement of the patient and

raising of the red-cell count are far more important factors in treatment than any attempt to reduce the white-cell count, and that when the white-cell count has fallen to the neighbourhood of 18,000 to 20,000, further X-ray treatment should be suspended for a time. In both types of case the risk of any superadded infection such as influenza is to be guarded against as far as possible, since such infections nearly always lead to a rapid relapse, which is likely to, and often does, prove fatal. In cases of chronic lymphatic leukaemia, provided we can keep the red-cell count within normal limits, a white-blood count of from 30,000 to 40,000 is quite consistent with good health, and a reduction below 20,000 is not easy to obtain without adversely affecting the red-blood count, and should not be aimed at.

Radio-dermatitis and Radio-necrosis.—H. D. Gillies and A. H. McIndoe,² in a paper on plastic surgery in chronic radio-dermatitis and radio-necrosis, classify the cases into: (1) Patients who have received a single dose of X rays or radium for diagnosis or treatment; (2) Patients who have undergone treatment for a chronic condition and who received small but oft-repeated doses for a long period, often resulting in ulceration; and (3) Professional workers with X-ray apparatus suffering from burns of the hands and face. They state that complete excision is followed by rapid relief of symptoms and freedom from the risk of carcinomatous change. Cure, however, cannot be considered as satisfactorily attained if no attempt is made to avoid the secondary contraction which follows healing by granulation. Indications for operative measures are: pain, itching, ulceration and discharge, deformity from contraction, cosmetic appearance, and epitheliomatous changes.

Ringworm of the Scalp.—S. Cochrane Shanks⁴ states that he finds the mekapion a more efficient and reliable measure of dosage than either the Sabouraud pastille or McKee's constants. Using the mekapion, uniform, complete, and successful results were obtained in 100 consecutive cases, whereas with the former measures the tendency to under-expose because of the uncertainty of the dosage resulted in a fair proportion of incomplete results. He considers that thallium acetate treatment is quite unwarranted because accidental over-dosage can cause the death of the patient, and nearly forty deaths have already been reported. He describes a simple method of immobilizing young children during irradiation. Efficient inspection, detection, and treatment of ringworm of the scalp has considerably reduced its incidence.

Increased Voltage and Filtration.—N. S. Finzi⁵ holds that improved results had always followed increased voltage and increased filtration, and that better results could be obtained with plants yielding radiation at 900 k.v. than with those at 180 to 200 k.v. He is supported by G. F. Stebbing,⁶ who states that as the wave-length was shortened the clinical results showed larger percentages of recoveries and less inconvenience to the patients, the best results so far obtained being by means of pure gamma radiation.

Radium Therapy.—Viscount Lee of Fareham,⁶ a layman who had presided over the National Radium Commission for the past three and a half years, states that the radiological enthusiast, who, like the young sportsman, may be more interested in his gun than in his quarry, may also need restraint, and the lust for heavier weapons must be kept within bounds—that is to say, the pursuit of science may become too costly in human life. "I make no concealment of the fact," he states, "that throughout these controversies my sympathies go out to the patient first and to the technician afterwards."

The radiologist should not be merely a specialist in one field of science, he should be an expert clinician as well, and be recognized as such by his surgical colleagues. Viscount Lee holds strongly to the opinion that they should be prepared to work together on terms of complete equality. The idea that

surgeons, however eminent, are competent to practice radium therapy without an intensive course of special training is a fond delusion and one not well conceived in the interests of the patient. The surgeon needs the co-operation of the radiologist just as the latter needs the co-operation of the surgeon, and it is only by this whole-hearted partnership that practical research into these grave clinical problems and an attack upon the scourge which is increasingly afflicting humanity can proceed on a united front and with the best hopes of success.

Amidst all these perplexities one agreed conclusion with regard to radium therapy stands out in clear relief, and it is that the margin between the general destruction of normal tissues and the selective destruction of the malignant cells invading them is very small. The real deficiency is not of the element itself but of persons qualified to use it. The existing stock of radium in the country, if properly used and organized, is sufficient for present needs.

Viscount Lee emphasizes the dangers of quack remedies containing radium, and considers that the best safeguard to the public is its price—i.e., £15,000 per gram. Speaking of the 4-gram bomb he said: "The results were disastrous, and to what extent they may have been due, respectively, to selection of unsuitable cases, exclusion of other methods of treatment, errors in technique, or merely insufficient experience, I wish to express no opinion." The verdict of the Scientific Conference summoned by the Presidents of the Royal Colleges of Physicians and Surgeons was that: "In view of all the circumstances the action of the Commission in abandoning the 4-gram bomb was certainly justified".

The Commission reports that the most authoritative opinion is now inclined to lay down that, in order to become a radium officer in the full acceptance of the term, it is desirable that an otherwise qualified candidate should be trained at a recognized centre, under skilled radiologists, for a period of not less than twelve months.

Tumours.—Ralston Paterson,⁷ in a paper on classification of tumours in relation to radiosensitivity, groups tumours according to their relative sensitivity to radiation contrasted with the resistance of the skin, and suggests technique for treatment which is in accordance with this relative sensitivity. As it was subsequently pointed out in the discussion, such a method of classification is empirical. Tumours identical in clinical and histological appearance in different individuals show marked variation in response to radiation. Among the factors considered as decreasing sensitivity Paterson included poor nutrition, poor blood-supply, anæmia, cachexia, syphilis, previous surgery, sepsis, and previous radiation—in other words, any factor which put a severe call on the hæmatopoietic system diminished the response to radiation.

Effect of Radium on Precancerous Skin Areas.—W. Cramer,⁸ in a paper on this subject, states that the application of radium to a precancerous area of skin delays and even inhibits the development of malignancy. This effect was most marked where the precancerous conditions were not too far advanced and the dose of radium was relatively large as measured by the skin reaction. No evidence of any kind was obtained that radium, in the doses given, had the effect of breaking down the resistance of the skin to the development of malignancy.

Cancer of the Uterus.—At a discussion⁹ on radium treatment in cancer of the cervix uteri at the Centenary Meeting of the British Medical Association A. Lacassagne stated that between 1919 and 1926 at the Institut du Radium they had treated 678 cases, with a five-year cure rate of 26 per cent. The percentage of cases was definitely increasing as technique improved. During

1919 and 1920 it had been only 10 per cent and 17 per cent respectively. In 1921 the technique of intra-uterine radium had been instituted and was still applied systematically in every case. The whole length of the uterus was filled with tubes of radium containing 60 to 70 mgrm. screened by 1 to 1.5 mm. of platinum; other tubes were held around the cervix, the total dosage being about 8000 mgrm. hours. In 1921-22 and 1923 this treatment had been applied alone, and the cure-rate had risen to 30 per cent. Since 1924 the treatment had been reinforced by radiation of the pelvis, either with X rays or from a powerful radio-active source of 4 grm. of radium element situated 10 cm. from the skin applied to several fields. The percentage of five-year cures had risen to 36 per cent. For Stage 1 cases it was 86 per cent, for Stage 2, 42 per cent, Stage 3, 30 per cent. Streptococcal infection interfered with radium treatment.

Professor Voltz⁹ pointed out that during the war Germany had been unable to obtain radium and therefore had developed a special X-ray technique; 1973 cases of uterine carcinoma had been under observation for periods of between five and twenty years. The absolute cure for 1913-26 was 18.5 per cent. In the last two years of the period, during which 404 cases had been treated, the five-year cure rate was 25 per cent. The primary mortality was 0.8 per cent. Radiotherapy gave a cure in 17.9 per cent of inoperable and 4.9 per cent of 'incurable' cases.

Victor Bonney⁹ claimed that the surgeon could cure one out of every five cases of cancer of the cervix seen and one out of every three operated on. This was a fixed result.

Gray Ward⁹ gave particulars of the technique used and the results obtained at the Women's Hospital, New York.

Malcolm Donaldson⁹ summed up in favour of radium therapy on the grounds that: (1) The survival rate was as good as after operation; (2) The mortality was negligible; (3) The technique was much easier than that of the operation; (4) Patients feared it less and therefore sought it earlier.

Elizabeth Hurdon⁹ stated that at the Marie Curie Hospital 686 cases of cancer of the cervix and 65 cases of cancer of the body had been treated. Of 74 cases treated more than five years ago 26 per cent were alive and well.

Serum Reactions in Radiotherapy of Cancer.—E. Crowin Lowe¹⁰ gives an account of the value of serum reactions in radiotherapy of cancer. He concludes that marked variation occurs in the subsequent reactions in the same patient's serum; that the earliest signs of cancer developing are very consistently associated with serum changes, which are reflected in the typical malignant fraction being present in the quantitative test findings; and that the gradual development of malignancy is associated with an increasingly positive and earlier tube reaction. Successful removal or regression of cancer tissue is followed by a gradual return to a less malignant and finally a normal serum finding. Recurrence is heralded by a reversion of a previously normal or less malignant reaction to one of more positive character. A serum reaction of this type should be of clinical help in follow-up observations in cases of cancer treated surgically and in helping to determine the results of radiological treatment. The test requires about 10 c.c. of blood collected from a patient in a fasting condition first thing in the morning, hæmolysis of the blood being carefully avoided.

Late Effects of Radiotherapy.—N. S. Finzi¹¹ contributes an interesting paper dealing with the late effects of X rays and radium on the skin, mucous membrane, subcutaneous tissue, muscle, bone, cartilage, lungs, and eyes. He emphasizes the danger of irradiating lesions produced by radiation; though temporary improvement may appear this is followed by very severe intractable

reactions. He finds **Durofix** an efficient remedy for the treatment of cracks in the fingers and nails. For acute inflammation he has used **Autogenous Vaccines** with complete success. Ulceration may be treated by **Surgical Removal, Vaccines**, local application of **Anæsthesin, Radiostol, Isotonic Salt Solution**, or other methods.

Miscellaneous.—S. B. Wigoder¹² describes the ingenious *devices for storing and carrying radium needles* used at the Bristol Royal Infirmary.

L. G. Grimmett¹³ gives a detailed description of the improved pattern of the direct-reading gamma-ray *electroscope* which is designed to facilitate routine radio-activity measurements in hospital radium departments.

The University College Hospital have issued a *report*¹⁴ on *radiotherapy* for 1931 which provides interesting reading. The report combines that of the Harker-Smith Registrar (R. S. Pilcher) on radium treatment and the Radiological Registrar (Gwenda Hilton) on X-ray therapy.

REFERENCES.—¹*Brit. Med. Jour.* 1932, ii, 665; ²*Brit. Jour. Radiol.* 1933, April, 242; ³*Ibid.* March, 132; ⁴*Ibid.* 1932, Oct., 761; ⁵*Ibid.* Nov., 823; ⁶*Ibid.* 1933, Jan., 7; ⁷*Ibid.* 1933, April, 218; ⁸*Ibid.* 1932, Aug., 618; ⁹*Ibid.*; ¹⁰*Ibid.* 1933, April, 207; ¹¹*Ibid.* March, 148; ¹²*Ibid.* May, 301; ¹³*Ibid.* 279; ¹⁴*Report on Radiotherapy, Univ. Coll. Hosp.* 1932, John Bale, Sons, & Danielsson.

YAWS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

The vexed subject of the relationship of yaws to syphilis has been discussed by D. B. Blacklock,¹ who deals seriatim with the various points which are commonly considered to differentiate between the two affections, and he brings forward evidence which he considers leaves it an open question whether "yaws is other than syphilis modified by age, race, and local conditions", as he holds that adult venereal syphilis as it affects natives in tropical countries differs as greatly from venereal syphilis in adults in temperate climates as does yaws. Thus he explains the non-congenital nature of yaws by the mothers having rarely escaped the disease in childhood, and he quotes evidence that extragenital primary sores in adults are more frequent in tropical than in temperate climates. He regards the greater frequency of plantar lesions and the greater rarity in that disease of lesions of mucous membranes, of the eyes, gummatous lesions of the internal organs, and of nervous diseases such as tabes and G.P.I., as explainable on racial and climatic conditions, and so not sufficient to differentiate the two classes of cases; nor does he think the failure of yaws to respond to mercury, and the lesser tendency to arterial degeneration and constitutional disturbances, to be of much importance. The subject is certainly one which lends itself to differences of opinion.

An analysis of 5000 Sachs-Georgi tests in yaws and syphilis in Southern Nigeria is reported by G. W. St. C. Ramsay.² About half were school children and the rest adults, and positive reactions in the children of 4 to 16 years were regarded as probable evidence of the asexual disease yaws, while in later life it may be due to either yaws or syphilis. Among 2600 children plus reactions were obtained in no less than 35.6 per cent, indicating a high yaws infection rate of the population, with a rapid rise from the age of 4 years to a maximum by the 6th year, followed by a steady fall, which is attributed to a tendency for the disease to burn itself out after the 6th year—a conclusion supported by Schöbl's work on experimental yaws in monkeys. In adults the position is much more complicated, and the percentage of positive results was found to increase steadily from 32 at the age of sixteen to eighteen to 50 at forty to forty-two, as against a steady fall between the ages of six to sixteen years. It is impossible to say how many of the adult reactions are due to persisting or relapsing yaws and how many to syphilis.

REFERENCES.—¹*Ann. Trop. Med. and Parasitol.* 1932, Oct. 29, 423; ²*Ibid.* July 14, 149.

YELLOW FEVER.*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

EPIDEMIOLOGY.—H. W. Kumm and M. Frobisher¹ have been unable to confirm the claim of L. Monteiro that yellow fever can be transmitted by the faeces of infected bedbugs. J. A. Kerr² finds that *Culex thalassius* is capable of transmitting experimental yellow fever by its bite after a long extrinsic period, so it may be of some importance where its density is great at places along the West African coast. *Mansonia uniformis* may retain the virus in its body for long, but appears to be unable to transmit it by its bites. H. W. Kumm³ has investigated the possibility of yellow fever being transmitted by blood-sucking bats in South America or by mosquitoes fed on them. Immediate mechanical transmission was obtained in two experiments by the bite of *Desmodus rotundus*, but mosquito transmission experiments were negative. Mosquito carriers in S. Nigeria have been further investigated by H. Beeukes and others⁴ in relation to climatic conditions, and they found all seasons of the year to favour transmission in the south, but in the north during the dry hot and cold seasons the duration of the life of the mosquito carriers of yellow fever is so reduced that it is doubtful if the disease can spread except during the rainy months of June to September, and they doubt if the disease can remain endemic there during the hot dry season with the harmattan winds prevalent. W. H. Hoffmann⁵ discusses the epidemiology of yellow fever, and he considers that although effective measures can be taken during epidemics, there is not yet sufficient control of the disease in its tropical endemic areas, so pandemics may yet occur, and more efficient measures are required to enable the endemic areas in America and West Africa to be successfully attacked.

PROPHYLAXIS.—Further work is reported on the preparation of a **Vaccine** against yellow fever made from a strain of virus after intracerebral passage through mice. A. W. Sellards and J. Laigret⁶ report confirmation of Theiler's statement that such a vaccine cannot produce fatal disease in monkeys, although it produced immunity in them after either subcutaneous or intraperitoneal injection. As killed monkey-virus vaccine did not protect man, the writers tried living mouse-passage virus prepared from the brains of infected mice killed on the sixth to ninth days after intracerebral inoculation. Five persons whose serum showed an absence of protective bodies were inoculated on one or more occasions, and all of them developed antibodies to the yellow fever virus, and three of them developed atypical febrile reaction, indicating that the mouse virus is not devoid of all activity in man. Max Theiler⁷ has investigated the possibility of using the intracerebral test in mice to determine the amount of antibodies in yellow fever immune serums. Suspensions of infected mouse virus, after filtration and preservation in a frozen state by the method of W. Lloyd and H. A. Penna,⁸ gave sufficiently constant results for comparison of different experiments when twelve mice were used for each test. The addition of 10 per cent of 0.9 per cent of normal serum prevented the rapid deterioration of the virus in normal sodium chloride solution, and some ascitic fluids, and 2.5 per cent egg albumen in distilled water, could also be used as a diluent. Further work is required to establish the value of the method.

REFERENCES.—¹*Amer. Jour. Trop. Med.* 1932, Sept., 349; ²*Ann. Trop. Med. and Parasitol.* 1932, July, 119; ³*Ibid.* 207; ⁴*Trans. Roy. Soc. Trop. Med. and Hyg.* 1933, March 23, 425; ⁵*Jour. Trop. Med. and Hyg.* 1932, Jan. 1, 359; ⁶*Brit. Med. Jour.* 1933, May 13, 82; ⁷*Ann. Trop. Med. and Parasitol.* 1933, April, 57; ⁸*Amer. Jour. Trop. Med.* 1933, Jan.

II

THE PRACTITIONERS' INDEX.

NEW PHARMACEUTICAL AND DIETETIC PREPARATIONS,
MEDICAL AND SURGICAL APPLIANCES, ETC.

In this Section we give short descriptions of the Pharmaceutical Products and the New Inventions of the past year. Every care is taken to notice only articles that seem worthy of our readers' attention. It should be understood that the information is supplied by the Makers. We invite all concerned with the Medical Manufacturing Industries to co-operate with us in making this section valuable for present and permanent reference.

A short typewritten description of each article is required, with the advantages claimed for it, and with the Maker's name and address appended. The Editors cannot accept reference to circulars or catalogues as a compliance with these conditions. Illustrations of instruments may be inserted if small.

In the section on Drugs, their composition, principal applications, and dosage should be stated in the fewest possible words.

All particulars for this Section should reach us by November 30.

PROGRESS OF PHARMACY, DIETETICS, Etc.

Acecolex is an aseptic paste containing acecoline, possessing trophic, anti-pruriginous and keratoplastic properties; indicated in the treatment of varicose ulcers, atonic wounds, and in all cases of dermatosis requiring an intensive epithelial renovating agent. Supplied in tubes of 35 and 105 grm. (The Anglo-French Drug Co. Ltd., 11-12, Guilford Street, London, W.C.1.)

Adexolin Emulsion.—This is a creamy emulsion, each fluid ounce of which contains 56,000 units of vitamin A. 2800 international units of vitamin D—i.e., vitamins A and D equivalent to its own volume of high-grade cod-liver oil—and 7½ gr. of calcium lactate. It is especially suited to the needs of run-down, under-nourished patients—infants, children, and adults—many of whom cannot take oily preparations. It is invaluable during convalescence, and its form and flavour will appeal to the most debilitated and fastidious child or adult. (Glaxo Laboratories, 56, Osnaburgh Street, London, N.W.1.)

Aklorepe.—Recent research regards achlorhydria (or hypochlorhydria) as a predominating feature in asthma and other allergic complaints. In order to provide patients with a portable, palatable, and economical means of taking requisite doses of dilute hydrochloric acid and pepsin, Aklorepe tablets have been prepared. Each tablet contains: betaine hydrochloride, 8 gr.; pepsin, ½ gr.; and is equivalent to 20 drops of acid hydrochloric dilute B.P.

Aklorepe is indicated in achlorhydria (as in allergic complaints, pernicious anaemia and sprue), gastritis, anorexia, and convalescence from febrile diseases. The dose is one tablet swallowed with a wineglassful of water three times a day immediately before meals. (Roberts & Co., 76, New Bond Street, London, W.1.)

Alkaline Compound Tablets and Solution.—The success which has attended the use of alkalis in the prevention and treatment of toxæmias of pregnancy, as demonstrated by the clinical work carried out in the various Glasgow maternity hospitals, has resulted in a wider application of this form of treatment. Compressed tablets and ampoules of solution made according to the formula of Drs. Cameron and Thompson are now available. Alkaline Compound tablets are supplied in bottles of 21, 100, and 1000, and the solution is issued in double ampoules put up in boxes of 6 pairs. (Parke, Davis & Co., 50, Beak Street, W.1.)

Anti-pneumococcus Sera.—Approximately half of all cases of lobar pneumonia in various parts of the world are caused by pneumococcus Type I or II. Therefore many physicians wish to give mixed I + II serum immediately the patient is seen. For this purpose 'Wellcome' Brand Concentrated Anti-pneumococcus Serum, Type I plus II, is available. Each phial of the mixed concentrated serum contains 10,000 units of each antibody.

The type of the infecting cause is ascertained, and if it belongs to Type I or II, the appropriate serum is used for treatment. Both concentrated and unconcentrated anti-pneumococcus sera of each type are issued. 'Wellcome' Brand Sera are prepared at The Wellcome Physiological Research Laboratories, Beckenham, Kent, and supplied by Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.

Attention is drawn to the existence of a system of Telegraphic Code Words which simplifies the ordering of these products and ensures correctness. This is of particular value where the title of the product is in any way involved. Reference to this code may be found in Wellcome's Medical Diary or the firm's trade price list.

Antivirus Jelly (Mixed).—A mixture of the antiviruses—i.e., the sterile, detoxicated filtrates—prepared from cultures of a number of strains of staphylococci and streptococci, incorporated in a glycerin base. This preparation, which is put up in tubes fitted with a special nozzle, carries specific immunizing substances against virulent strains of pyogenic organisms. It is designed for the treatment of boils, carbuncles, whitlows, and other accessible suppurative lesions. It is also used as a dressing in the treatment of perineal tears. (Glaxo Laboratories, 56, Osnaburgh Street, N.W.1.)

Biomucine is a pure, neutral and sterile mucin obtained from gastric mucus, which possesses many advantages over other therapeutic agents hitherto employed in the treatment of gastro-duodenal affections. It is the natural antacid and physiological protector of the gastro-duodenal mucosa and provides ideal antacid treatment, inhibiting the action of any excess acid and regulating the pH value of the gastric contents to the point most suitable for the normal functioning of the stomach. Indicated in all painful affections of the stomach due to hyperchlorhydria, and in gastric and duodenal ulcers.

Biomucine is supplied in boxes of 24 cachets, the halves of which are readily separable. The cachets may be swallowed whole, or, preferably, separated and the contents taken suspended in cold water. The dosage naturally depends on the condition to be treated; in cases of peptic ulcer the contents of 2 cachets should be taken 15 minutes before commencing a meal and repeated, if necessary, before the close of digestion; in hyperchlorhydria, gastritis, etc., 2 cachets before each of the two principal meals daily is usually sufficient to prevent the occurrence of painful attacks during the day. (The Anglo-French Drug Co. Ltd., 11-12, Guilford Street, London, W.C.1.)

Biscuits.—A cereal food in the form of biscuits has been introduced under the name of 'Munch'. There are 146.3 calories in every ounce. They are very palatable without being indigestible or filling, the flavour is unique, and their golden brown colour and crispy texture make them most attractive to old and young alike. These biscuits are made by Munch Ltd., Bradford, Yorkshire, and may be recommended.

Bismurung is an ointment of oxychloride of bismuth in colloidal form in a specially prepared emollient base. It was originally introduced for the treatment of lupus erythematosus with striking results (*Lancet*, 1931, Jan. 17; *Brit. Jour. Dermatol. and Syph.*, 1931, Nov.; *MEDICAL ANNUAL*, 1933, p. 427). On account of its antiseptic, protective, and sedative qualities, it has since proved remarkably useful for inflamed, irritated, or painful conditions of the skin and mucocutaneous junctions, e.g., pruritis, dermatitis, eczema, varicose ulcers, burns, herpes, hemorrhoids, inoperable cancer, etc. (The Blythwood Chemical Co. Ltd., 213, West Campbell Street, Glasgow, C.2.)

Bismuth Oxychloride.—Bismuth Oxychloride is an insoluble salt used for the injection treatment of syphilis. 'Hypoloid' Brand Bismuth Oxychloride, suspended in a sterile isotonic saline solution, is prepared by Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C., and issued in rubber-capped bottles of 25 c.c., containing 0.1 gm. of the medicament per c.c. It is well tolerated in respect of pain and nodosities, and is absorbed at a uniform rate, which, without causing toxic symptoms, produces effective antispirochætal effect.

Calcium Lactobionate with Parathyroid (Elixir and Tablets).—Each fluid drachm of the elixir is equivalent to 5 gr. of calcium lactobionate and $\frac{1}{10}$ gr. of fresh parathyroid; each tablet is equivalent to 5 gr. of calcium lactobionate and $\frac{1}{10}$ gr. of dry parathyroid. Calcium lactobionate is more palatable than calcium lactate and calcium chloride, more soluble than calcium gluconate and lactate, and more stable than calcium lactate. It does not appear to give rise to any stomach irritation and does not produce the nausea resulting in many patients from the chloride. Dosage: One or two teaspoonfuls of the elixir, or one or two tablets, twice or thrice daily. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Cremor Digestans.—This combines McLean's alkaline treatment with the useful digestives pancreatin and papain (*papaya caraya*), with in small sedative dose (2 min. in 2 fluid drachms), tinct. belladonna B.P. (poison). The dose is 1 to 2 fluid drachms. (Reynolds & Branson Ltd., 13, Briggate, Leeds.)

Dicalcium Phosphate.—Dicalcium phosphate (P., D. & Co.) is an effective calcium-phosphorus compound, in that it contains these two very important elements in a form that is readily soluble in the acid gastric secretions, and thus readily available for assimilation. It is supplied in an extremely fine state of sub-division and represents calcium and phosphorus in properly balanced proportions for correct physiological utilization. Dicalcium phosphate (P., D. & Co.) is supplied in bottles of 4 and 16 oz. (Parke, Davis & Co., 50, Beak Street, W.1.)

Digoxin.—Chemical investigations carried out in the Experimental Laboratories of the Wellcome Chemical Works have resulted in the discovery and isolation of a new crystalline glucoside, described as digoxin. After pharmacological examination at the Wellcome Physiological Research Laboratories the glucoside was submitted to the Therapeutic Trials Committee of the Medical Research Council for clinical investigation. The results have recently been published. They indicate that digoxin is a useful member of the digitalis series, being particularly valuable in the treatment of auricular fibrillation when rapid effects are desired. It is rapid in its action even when given orally, so that intravenous injection is unnecessary save in exceptional cases.

As a pure substance with well-defined chemical and physical properties digoxin provides a digitalis preparation of constant activity requiring no biological standardization. It has now been made available to the medical profession by Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C. The following products are issued:—For oral administration: 'Tabloid' Digoxin, 0.25 mgrm. (bottles of 25 and 100), and Solution of Digoxin, 0.5 mgrm. in 1 c.c. (bottles of 30 c.c. and 250 c.c.). For intravenous administration: 'Hypoid' Digoxin, 0.5 mgrm. in 1 c.c. (boxes of 10).

Enteromucine consists of pure natural mucin obtained from intestinal mucus presented in the form of an aromatic granular powder. Enteromucine constitutes an ideal laxative and serves as a natural regulator and protective agent of the intestines. Its action is, primarily, one of protection, both mechanical and chemical; it neutralizes fermentation, has an important function as a lubricant, and hydrates the intestinal contents with a consequent activation of peristalsis.

Acting in an essentially mild and gentle manner enteromucine may be administered whatever the condition of the intestines—even when ordinary laxatives are contra-indicated—and can be advantageously employed in cases of constipation accompanying colitis, in enteritis and various forms of colitis, in simple constipation, and in intestinal atony.

Dosage: Two teaspoonfuls twice or thrice daily at meal times, the granules being masticated and swallowed with a little water. Supplied in tins containing 100 gm. (The Anglo-French Drug Co. Ltd., 11-12, Guilford Street, London, W.C.1.)

Euparatoe.—A biologically standardized solution of the calcium-controlling hormone of the parathyroids, prepared by a new process and containing 20 Collip units per c.c. For use in tetany, hæmorrhage, tuberculosis, chilblains, chronic ulcers, plumbism, etc. **Dosage:** From 10 units every third day to 20 units thrice daily. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Ferrolac.—A preparation of Full-cream Glaxo in each pound of which are incorporated iron and ammonium citrate and Calciferol G.L. in such quantities that each pint of reconstituted milk contains 125 parts of iron per million and 165 international units of vitamin D. This is quite definitely a milk for treatment, and should be given only to infants suffering from nutritional (iron deficiency) anaemia. For prophylactic purposes the amount of iron in Sunshine Glaxo and Full-cream Glaxo is sufficient. (Glaxo Laboratories, 56, Osnaburgh Street, London, N.W.1.)

Filivex (Liquid and Powder).—These are highly concentrated fish-liver extracts prepared in accordance with the method described by Professor L. S. P. Davidson in "The Treatment of Pernicious Anaemia with Fish-liver Extract" (*Brit. Med. Jour.*, 1932, Aug. 20, p. 347). Each fluid ounce of Filivex Liquid is therapeutically equivalent to the extract from 4 oz. of fresh mammalian liver, and each tube of the powder to the extract from 8 oz.

The special advantages of these products are: (a) That they double or treble the red blood-corpuscle count and the hæmoglobin percentage in cases of pernicious anaemia within a few days of beginning the treatment, and in many cases produce the reticulo-cyte response within twenty-four to forty-eight hours; and (b) That their low cost permits of an annual saving to patients of several pounds—even when the comparison is made with the cheapest mammalian liver extract available in this country. (Glaxo Laboratories, 56, Osnaburgh Street, London, N.W.1.)

Fosfoxyl presents phosphorus in a particularly active, non-toxic, and perfectly assimilable form which is well tolerated by the stomach, liver, and kidneys. It is supplied in two forms of equal therapeutic activity: syrup (peppermint flavoured) and pilules (keratin coated), each 10 c.c. of the syrup being equivalent to 4 pilules and containing 10 cgrm. of sodium terpinol-hypophosphite, corresponding to 13 mgrm. of phosphorus organically combined and in a colloidal state.

Fosfoxyl owes its therapeutic properties exclusively to this active colloidal phosphorus principle; it constitutes a potent nerve and general tonic and restorative. It acts as a powerful stimulant of the central nervous system, and promotes mental activity; it is an excitant of appetite and assimilation, a stimulant of endocrine secretion, a fixer of the calcium ion, and a tissue modifier and alterative.

Dosage: A dessertspoonful of the syrup in a little water twice or thrice daily, or two pilules three or four times daily, before meals. Children (above 5 years), half the adult dosage. Available in bottles of 5 oz. of syrup and in boxes of 60 pilules. (The Anglo-French Drug Co. Ltd., 11-12, Guilford Street, London, W.C.1.)

Full-cream Glaxo.—This new addition to the Glaxo range of dried milk foods is a standardized full-cream dried milk enriched with prophylactic amounts of ostelin vitamin D (Calciferol G.L.) and iron. Each pint of reconstituted milk contains 165 international units of vitamin D and five parts per million of iron. It is intended for infants whose digestive capacity has become adequate for dealing with the full fat and protein content of cow's milk. In most cases it may replace humanized milk (Sunshine Glaxo) at the third or fourth month. (Glaxo Laboratories, 56, Osnaburgh Street, London, N.W.1.)

G.L. Preparation-A.—An exceptionally high concentrate of vitamin A without any addition of vitamin D. Its vitamin-A potency is equivalent to that of 120 times its own volume of high-grade cod-liver oil; or, expressed in more practical terms, one minim is equivalent to 2 drachms of cod-liver oil. Each cubic centimetre contains 240,000 units of vitamin A; and each 3-minim capsule contains 48,000 units.

G.L. Preparation-A has been specially designed to meet the need, which may arise in exceptional circumstances, for a concentrate of the epithelium-protecting vitamin that can be administered with safety to patients for whom vitamin D is believed to be contra-indicated. (Glaxo Laboratories, 56, Osnaburgh Street, London, N.W.1.)

G.L. Syrup for Children.—This new and most delicious tonic for children contains iron in a stable and assimilable form, salts of copper and manganese, glycerophosphates of calcium, potassium, and sodium, and an amount of vitamins A and D equivalent to its own volume of high-grade cod-liver oil. In each fluid drachm there are $\frac{1}{8}$ gr. iron (ferrous), $\frac{1}{8}$ gr. lime (CaO), 7000 units of vitamin A, and 525 international units of vitamin D. The recommended dose is a fluid drachm three or four times a day. (Glaxo Laboratories, 56, Osnaburgh Street, London, N.W.1.)

Glucose Orange ('Allenburys').—A combination of orange juice with about 50 per cent of pure glucose. When mixed with water it forms a refreshing, nutritious drink. The orange juice retains its original vitamin C and the glucose is an easily absorbed restorative, specially valuable for children. **Dosage:** A tablespoonful in a glass of water, or as required. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Glycerin. Ephedrae Co.—Each fluid drachm of this preparation contains extract of ephedra equivalent to ephedrine hydrochloride $\frac{1}{2}$ gr., with ephedrine hydrochloride $\frac{1}{2}$ gr., codeine phosphate $\frac{1}{2}$ gr., tinct. lobelia, B.P. 1885, $7\frac{1}{2}$ min., and extract. ipecac. liq., $\frac{1}{2}$ min. For use in asthma, bronchitis, etc. **Dosage:** One or two teaspoonfuls thrice daily. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Gynestryl is pure crystalline ovarian follicular hormone (scientifically known as folliculine or cestrin), constant in activity, rigorously standardized, and supplied in a concentration that definitely corresponds to woman's actual physiological requirements. Gynestryl is indicated in all conditions arising from ovarian hypofunction, in disturbances of the menopause, and during pregnancy for the prevention of nausea and pernicious vomiting. Available in ampoules of 1 c.c. (boxes of six), each c.c. containing $\frac{1}{10}$ mgrm. of crystalline folliculine, equivalent to 1000 international units; also supplied for effective oral administration in solution (bottles of 10 c.c.), and in tablets (boxes of 40)—1 c.c. of the solution or 4 tablets containing $\frac{1}{10}$ mgrm. of dihydro-folliculine, equivalent to 1000 international units.

Dosage: By injection, $\frac{1}{2}$ to 1 c.c. at intervals, in series of 4 to 6 injections per month; Orally, 50 drops or 4 tablets daily, in 3 or 4 doses, for from 8 to 12 days each month. (The Anglo-French Drug Co. Ltd., 11-12, Guilford Street, London, W.C.1.)

Half-cream Food ('Allenburys').—This modified milk food contains, when prepared for use, 1.5 per cent of fat, with 2 per cent of protein, 8.2 per cent of lactose, 3.7 per cent of dextrin maltose, an ample proportion of vitamin D, and a calorific value of

122 calories per ounce of dry food. It has been manufactured to meet the need of babies in whom foods containing the normal proportion of fat produce dyspepsia, constipation, diarrhoea, or the syndrome of ketosis, nervousness, and cyclic disturbances. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Halibol.—A combination of halibut-liver oil with viosterol. The halibut-liver oil is prepared by a special process which results in a practically tasteless and odourless product with an attractive golden colour. Halibol is standardized so that it has a "blue value" of 1000 and a vitamin D content of 10,000 units per grm. It is sixty times as rich in vitamins A and D as a good cod-liver oil. Its use is indicated when cod-liver oil is refused or not tolerated, in the prevention and treatment of rickets, osteomalacia, etc. Dosage:—Rickets: prevention, 2 to 5 min. daily; treatment, 5 to 7 or more min. daily. Osteomalacia, 7 or more min. daily.

Halibol Capsules.—Each of these contains 0.2 c.c. of Halibol, i.e., 2000 units of vitamin D and the amount of vitamin A present in about 3 fluid drachms of cod-liver oil. They are prepared for convenience of administration in the conditions for which Halibol is recommended. Dosage: Children, one or two capsules daily, according to age; Adults, two to four capsules daily.

Halibol-B Capsules.—Each of these contains the amount of vitamin A present in about 3 fluid drachms of cod-liver oil, 2000 international units of vitamin D, and the amounts of vitamins B₁ and B₂ present in 5 gr. of dried yeast. Halibol-B is offered for use in various forms of debility due to multiple vitamin deficiency. It provides an accessory source of vitamins for the diet in periods of increased physiological strain, such as active growth, adolescence, pregnancy, lactation, and convalescence. Dosage: Children, one or two capsules daily; Adults, two to four capsules daily.

Halibol-Calcium Capsules.—Each of these contains the amount of vitamin A present in about 3 fluid drachms of cod-liver oil, 2000 international units of vitamin D, and 5 gr. of calcium sodium lactate. They form a convenient prophylactic preparation for administration in pregnancy, when the drain on the mother's resources is liable to lead to deficiency of vitamins A and D and calcium, with consequent osteomalacia in the mother, and rickets, defective dentition, and malnutrition in the baby. Administration of Halibol-calcium is indicated also in conditions of calcium deficiency, such as chilblains (in the thin, hypotonic, scrofulous type of patient), menorrhagia, purpura, rickets, marasmus, tuberculosis, and other debilitating diseases. Dosage: Adults, two to four capsules daily; Children, one or two capsules daily.

Halibol Malt.—Contains vitamins A and D equivalent to 30 per cent by volume of cod-liver oil (twice the vitamins A and D content of Extract of Malt with Cod-liver Oil, B.B.), combined with malt extract. It is for use where cod-liver oil with malt is refused or not tolerated, in rickets and allied states of undernutrition. Dosage: Children, a teaspoonful to a tablespoonful thrice daily; Adults, one to two tablespoonfuls thrice daily. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Haliborange.—A combination of Halibol with 'Allenburys' Orange Juice. One teaspoonful contains amounts of vitamins A and D equivalent to those present in a teaspoonful of cod-liver oil and an amount of vitamin C equal to that present in about two teaspoonfuls of orange juice. Haliborange has a delicious flavour and may be given with advantage in scurvy and rickets. Dosage: Babies under one year, from $\frac{1}{2}$ to 3 teaspoonfuls daily; adults, $1\frac{1}{2}$ to 3 tablespoonfuls daily; children, intermediate amounts. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Halibut Liver Oil.—The Crookes Laboratories, Park Royal, London, N.W.10, were the first to introduce halibut liver oil to the medical profession of the United Kingdom at the Centenary Meeting of the British Medical Association, July, 1932. Collosol Brand halibut liver oil represents a very fine quality of halibut liver oil. This is due to the special solvent-free extraction process, evolved in and employed by the Crookes Laboratories, which enables a beautiful, pure, golden oil to be presented with a vitamin A value of at least eighty times and a vitamin D value of at least ten times that of the very finest cod-liver oil.

The great attention to detail which is associated with all the products emanating from the Crookes Laboratories is evinced by a label affixed to each bottle of Collosol Brand halibut liver oil stating the number of the particular batch, the date of bottling, and the vitamin value by the Blue Unit B.P. test (10 per cent dilution), the biological test, and the spectroscopic test. The range of preparations includes the Oil, Capsules, Halimalt (Collosol Brand Halibut Liver Oil and Malt Extract), and Halidexol (an extremely palatable Halibut Oil Emulsion).

Halibut Liver Oil.—The 'Fortior' brand Halibut Liver Oil is a natural oil of exceptional purity, standardized in vitamin A content to the equivalent of at least sixty times (actually eighty times) its bulk in cod-liver oil. Available to practitioners for dispensing in 4 oz. bottles at 10/-. (H. R. Napp Ltd., 3 and 4, Clements Inn, W.C.2.)

Hebaral Sodium (Sodium hexyl-ethyl barbiturate).—A new barbituric compound with rapid sedative, hypnotic, and antispasmodic effect. Unlike other barbituric acid compounds Hebaral Sodium does not produce lassitude, vertigo, headache, and nausea, neither is it habit-forming. It produces sleep which approximates the normal, after which the patient awakes in a refreshed condition without any residual effect. There is a wide margin of safety between its therapeutic and toxic doses. Supplied in bottles of 25 or 100 capsules. (Parke, Davis & Co., 50, Beak Street, W.1.)

Hemoprotein (Brooks).—Hemoprotein (Brooks) is a definite mixture of protein fractions prepared from ox-blood fibrin by peptic digestion and subsequent fractionation by precipitation. It provides a non-specific protein of low toxicity, and is particularly adapted for non-specific protein therapy as it is free from the disagreeable reactions, such as fever, chills, sweating, etc., so frequently associated with the use of other non-specific proteins. The reactions often seen in foreign protein therapy are attributed to the effect of one group of proteins, and the beneficial action to an entirely different group; thus the separation of these two groups makes available therapeutically active non-toxic protein.

Extensive clinical trial has produced uniformly successful results in a large number of cases of acute and chronic arthritis. Good clinical results have also been obtained in such affections as influenza, tuberculosis, pneumonia, and various streptococcal infections. Supplied in vials of 10 c.c. (Parke, Davis & Co., 50, Beak Street, W.1.)

Hepamult.—A new standardized liver extract, presented in the form of palatable granules, and offered at a price which places this therapy on an economical basis. It is claimed that 10 grm. (average daily dose) of Hepamult represents the equivalent of, at least, 8 oz. of fresh liver, and this quantity will cost no more than 6d. daily. (H. R. Napp Ltd., 3 and 4, Clements Inn, London, W.C.2.)

Hogastrin is a palatable liquid extract prepared from freshly killed hogs' stomachs, containing the intrinsic anti-anæmic principle in active solution.

Clinical tests have shown that the administration of Hogastrin leads to a consistent increase in the blood count, which in some cases amounts to over 80 per cent.

The high degree of activity of Hogastrin is due to the fact that the maws from the freshly killed hogs are macerated immediately with a suitable menstruum, instead of being treated in the dry or salted state. Thus the anti-anæmic factor is supplied in active solution in a concentrated and palatable form. The dose is one to two teaspoonfuls three or four times a day. (Giles, Schacht & Co., Clifton, Bristol, 8.)

Hypnotic Products.—Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C., have added to their list the following three hypnotic products: 'Tabloid' Phenobarbitone, 1 gr.; 'Tabloid' Phenobarbitone Soluble, 1 gr.; 'Tabloid' Barbitone Soluble, 5 gr. These products are issued in bottles of 25 and 100.

The two 'Tabloid' Phenobarbitone products are of special value in the treatment of epilepsy and aural vertigo. They are also helpful in insomnia and states of nervous excitement. 'Tabloid' Barbitone Soluble is more rapid in action than ordinary barbitone, which is one of the most effective hypnotics of the ureide series.

Iron-Arsenic-Strychnine Compound G.L.—A preparation of iron, arsenic, strychnine, and phosphorus, reinforced by copper and manganese as activating substances. Chlorbutol is incorporated to ensure that its administration shall be relatively painless. This preparation is specially designed as a tonic for debilitated patients whose metabolic processes need prompt stimulation; and for the treatment of post-operative and other forms of secondary anemia. It is administered by intramuscular injection. (Glaxo Laboratories, 56, Osnaburgh Street, London, N.W.1.)

Irradex.—A preparation containing both manganese and iron in a palatable and diastatically-active malt vehicle. It also contains vitamins A, B, and D in generous quantity, the vitamin-A potency being equal to that of a high-grade cod-liver oil, and the vitamin-D potency increased by the inclusion of viosterol to a potency of five times that of a high-grade cod-liver oil. The vitamin-B value is supplied by a concentrated, biologically-standardized vitamin B extract from wheat germ. Irradex forms a valuable nutrient-tonic for both children and adults who are underweight or debilitated. Supplied in jars holding about 1 lb. (Parke, Davis & Co., 50, Beak Street, W.1.)

Liver Extract B.D.H.—This preparation, noticed on p. 547 of our last volume, is now supplied in ampoules for injection and also in liquid form, Liquid Extract of Liver B.D.H. (Ext. Hepat. Liq. B.F.). (The British Drug Houses Ltd., Graham Street, London, N.1.)

Lixen Pastilles contain Lixen extract of senna prepared by a special cold process which makes the drug's action gentler without destroying its valuable aperient property. These pastilles contain no sugar other than that present in the extract, and their total

sugar content is only about 1·5 per cent. They have been prepared for diabetics and others who prefer an almost sugar-free laxative. Dosage: Adults, one to two; Children, a half to one. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Milk Food with Additional Iron ('Allenburys').—This food contains 900 parts per million of iron. It is for use in cases of nutritional anaemia of infants, in accordance with the findings of the Medical Research Council Special Report No. 157. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Nasal Jelly (Antivirin Brand).—This is a mixture of the antiviruses—i.e., the sterile detoxicated filtrates—prepared from cultures of *B. pneumoniae* of Friedländer, *M. catarrhalis*, and mixed streptococci, incorporated in a glycerin and gelatin base. It is put up in tubes fitted with a special nozzle, and is intended for application to the nasal mucous membrane in the treatment of common colds. Antivirin Nasal Jelly should be applied, if possible, at the onset of a cold; but it is also useful when the condition is advanced. (Glaxo Laboratories, 56, Osnaburgh Street, London, N.W.1.)

Oestroform is a standardized preparation of the crystalline ovarian follicular, or oestrus-producing, hormones. It has the chemical composition expressed by the formula $C_{18}H_{22}O_2$ (keto-hydroxy-oestrin), and when administered it has the effect of producing the phenomena associated with the state of oestrus in the female.

The function of the follicular hormone is, however, of a wider character, for it regulates the sex cycle and maintains the female accessory and secondary sexual organs in the fully developed condition characteristic of the organism after puberty.

Oestroform is available in sterile solution for injection, also in tablets for oral administration. The solution and the tablets are standardized to an activity of 1000 international units per c.c. or per tablet; thus it will be seen that Oestroform is of a remarkably high activity. Moreover, it is available at a price which permits of its being employed as a routine measure in the ordinary course of general medical practice. (The British Drug Houses Ltd., Graham Street, London, N.1.)

Oleo-Sanocrysin.—The secondary symptoms sometimes observed after intramuscular injections of aqueous solutions of sanocrysin can be avoided by the use of a suspension of sanocrysin in oil, and such a preparation is now available under the title of Oleo-Sanocrysin. The dosage and indications are the same as for sanocrysin, and each batch of the product is subjected to the same careful tests as are applied to sanocrysin. Oleo-Sanocrysin is supplied in either a 5 or 10 per cent suspension, and is issued in ampoules of 2, 3, and 5 c.c., thus offering a range of doses from 0·1 to 0·5 grm. The sole agents for Great Britain and the British Empire (with certain exceptions) are Parke, Davis & Co., 50, Beak Street, W.1.

Orkitone possesses marked tonic and restorative properties and contains the essentials for the reconstitution and nourishment of the nerve cells. Combining in an extremely palatable medium the dynamogenic properties of a specially prepared orchitic extract with those of nucleinic acid, arrhenal (di-sodium methylarsenate), and sodium glycerophosphate, it is specially indicated in the treatment of asthenia and neurasthenia, particularly of the sexual type, in both men and women. Orkitone is also of value in cases of debility and nervous exhaustion, and during convalescence following infectious diseases it stimulates natural recuperative faculties.

The adult dose is one tablespoonful three or four times daily after food. Supplied in bottles containing 8 oz. (The Anglo-French Drug Co. Ltd., 11-12, Guilford Street, London, W.C.1.)

Pentnucleotide.—This preparation, formerly Nucleotide K-96, is prepared under the direction of the Committee on Nucleotide Therapy of the Harvard Medical School. It is a mixture of the sodium salts of pentose nucleotides for intramuscular use in cases of agranulocytic angina (malignant neutropenia) and also when leucopenia occurs in infections which usually are accompanied by leucocytosis.

An instructive article on the subject by Dr. Ernest Bulmer (Birmingham) appeared in the *Lancet*, 1933, May 27, including the report of a case. In the *Jour. Amer. Med. Assoc.*, 1932, July 16, Dr. C. A. Doan gives the following mortality statistics in malignant neutropenia :—

TREATMENT	CASES	DEATHS	MORTALITY (percentage)
Untreated	Many	—	90 or over
Miscellaneous ..	178	133	74
Arsphenamine ..	33	24	72
Blood transfusion ..	53	34	64
Irradiation	64	34	53
Pentnucleotide ..	44	11	25

Available literature, including reprints of the above articles, will be gladly sent on request by Menley & James Ltd., 64, Hatton Garden, London, E.C.1.

Pepsacid (R & B).—An extremely active form of pepsin with bismuth in a dilute hydrochloric acid base. It is non-poisonous and safe for patients of all ages. The adult dose is one drachm in water, preferably immediately before food. (Reynolds & Branson Ltd., 13, Briggate, Leeds.)

Pneumodine.—A palatable preparation of pneumodine (iodo-ethyl allyl ether) with codeine phosphate, $\frac{3}{4}$ gr., and liq. bismuthi cit., 15 min., in each fluid drachm. It is indicated in chronic bronchitis, lung abscess, and other pulmonary affections of infective origin. The dose for adults is two teaspoonfuls or more, as directed by the physician, to be taken thrice daily, after food, well diluted with water or milk. For children, less, according to age. (Reynolds & Branson Ltd., Leeds.)

Procaine and Adrenalin.—Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C., have introduced three Procaine and Adrenalin products for use as local anaesthetics. 'Hypoloid' Procaine and Adrenalin presents procaine hydrochloride, 0.02 grm., and adrenalin, 0.0001 grm., in 1 c.c. in solution ready for immediate use. Issued in boxes of ten 'Hypoloid' ampoules.

Each 'Tabloid' Hypodermic Procaine and Adrenalin contains procaine hydrochloride 0.02 grm., adrenalin 0.0001 grm., and sodium chloride 0.009 grm. A solution can be readily made in the barrel of a syringe. Procaine hydrochloride is often preferred to a general anaesthetic for the reduction of fractures. The 'Tabloid' product is issued in tubes of twenty.

'Wellcome' Brand Procaine Dental Anaesthetic Solution is available in bottles of 25 c.c. Each cubic centimetre contains procaine hydrochloride 0.02 grm. and adrenalin 0.0001 grm.

Rubyl.—This is composed of double iodide of bismuth and quinine, and is used for intramuscular and deep subcutaneous injections in the treatment of syphilis.

A course of twelve injections is recommended, consisting of 3 c.c. every 3 or 4 days for the first five, and 2 to 3 c.c. every 3 days for the remaining seven injections. After 4 to 6 weeks a second course is given, and this may be repeated if necessary.

Rubyl is supplied in boxes of 12 ampoules, each containing 0.30 grm. of active product in 3 c.c. suspension. (May & Baker Ltd., Battersea, London, S.W.11.)

Saridone.—This new analgesic is issued in the form of 5-gr. oral tablets, each of which contains: phenylidimethylisopropyl pyrazolon $1\frac{1}{2}$ gr., acetphenetidin (phenacetin) $2\frac{1}{2}$ gr., trimethyldioxypurin (caffeine) $\frac{1}{2}$ gr., amylum $\frac{1}{2}$ gr. Clinical trials have demonstrated that Saridone is a quickly-acting analgesic with no harmful side actions. Its effect persists fully for several hours and then slowly diminishes, leaving no feeling of lassitude or other untoward symptoms. It is recommended for the relief of pain arising from headache, neuralgia, toothache, and many other causes. There is said to be no danger of habit formation. Dosage: Adults, 1 to 3 tablets; Children, $\frac{1}{2}$ to 2 tablets; repeated, if necessary, three or four times per diem. (The Hoffmann-La Roche Chemical Works Ltd., The Roche Laboratories, 51, Bowes Road, London, N.13.)

Scuroform (*n*-Butyl-*p*-aminobenzoate).—A local anaesthetic of low toxicity and with a rapid and prolonged action. Scuroform may be applied to the part on a plug of cotton-wool, or as a spray in post-operative work on the ear, nose, and throat. It is supplied either in powder (bottles of 25 grm.), saturated oily solution 8 per cent (bottles of 25 c.c.), or in glycerol-alcoholic solution 10 per cent (bottles of 25 c.c.). (May & Baker Ltd., Battersea, London, S.W.11.)

Sodium Calcium Lactate with Vitamin D Tablets.—These tablets each contain $7\frac{1}{2}$ gr. of sodium calcium lactate together with Calciferol G.L. equivalent to 500 units of vitamin D. Their special value as a means of administering calcium therapy lies in the fact that the salt itself is assimilated easily and with a minimum effect on the pH of the gastric and intestinal contents, and that, alone among preparations of this class, each tablet is associated with a sufficient quantity of exactly standardized vitamin D to ensure its absorption. A special advantage of the tablets is that, being quartered, they can be easily broken into four sections, each of which may then be swallowed separately. (Glaxo Laboratories, 56, Osnaburgh Street, London, N.W.1.)

Sodium Soneryl (Sodium Butobarbital).—This preparation has not only been found efficient (1) as a pre-operative narcotic, but also (2) as a safe and reliable anaesthetic for gynaecological and obstetric work.

(1) The dose recommended to be given one hour before operation, according to the patient's weight, is: 90 to 115 lb. = 3 capsules, 120 to 145 lb. = 4 capsules, 150 to 175 lb. = 5 capsules, 180 lb. and above = 6 capsules. (2) For gynaecological and obstetric work 1 to 3 capsules to be given, followed in 2 hours by 1 to 2 capsules. The

latter dose may be repeated every three hours. The interval between the doses should not exceed four hours. The first dose is given in primiparae when the os uteri is dilated $\frac{3}{8}$ to $\frac{1}{2}$, and in multiparae when the os is $\frac{1}{2}$ to $\frac{3}{4}$ dilated and regular pains are present.

Sodium soneryl is supplied in bottles of 20 capsules each containing 0.15 gm. (May & Baker Ltd., Battersea, London, S.W.11.)

Solganal-B Oleosum.—An oily suspension of aurothioglucoase for intramuscular use, this is claimed to be the safest and most efficient form of chrysotherapy and has the following advantages: Ease of administration; elimination of secondary effects; gradual absorption; and prolonged action.

Its value in the treatment of tuberculous conditions was favourably commented on at the International Tuberculosis Congress at the Hague, by Schroeder (Germany), and Dumarest and Mollard (France). Other indications are lupus erythematosus, psoriasis, and Wassermann-fast cases of syphilis and neurosyphilis, as well as infective arthritis of various types. Full dosage particulars and other details may be obtained from Schering Ltd., 188-192, High Holborn, London, W.C.1.

Spiroline is a stable elixir containing in each fluid drachm 3 gr. of di-iodo-caffeine hydriodide together with the soluble constituents of $7\frac{1}{2}$ gr. of coffee. In the compounding of the elixir a medium has been selected which appears to possess the power of enhancing the therapeutic value of the iodo-caffeine by increasing its rate of absorption into the system. The elixir is readily tolerated and is perfectly harmless.

Spiroline is employed in the treatment of asthma; it alleviates the distressing respiratory and cardiac symptoms of this disorder, and it prevents the occurrence of complications. It affords relief not only when given during an attack of asthma, but also at a later stage, when emphysema and chronic bronchitis have supervened. It is a cardiac stimulant, and, as such, is of value in cases of weak heart following influenza, diphtheria, etc. (The British Drug Houses Ltd., Graham Street, London, N.1.)

Streptococcus Immunogen Arthritis.—This product is an addition to the series of immunogens at present available, and is prepared from strains of *Streptococcus haemolyticus* and *Streptococcus viridans*, similar to those isolated by the various workers investigating the etiology of rheumatism. Streptococcus Immunogen Arthritis is administered as a desensitizing agent rather than a specific therapeutic agent, and is administered intravenously in gradually increasing doses. It is standardized so that 1 c.c. contains the antigens from 2000 million bacteria, and like the other immunogens it contains the minimum of protein, as the bacterial cells are removed in the process of manufacture. It is also practically free from toxin. Supplied in vials of 10 c.c. (Parke, Davis & Co., 50, Beak Street, W.1.)

Sweet Whey ('Allenburys').—Composition: milk sugar, 75 per cent; whey protein (chiefly lactalbumin), 13 per cent; milk salts, 9 per cent; fat, 1 per cent; moisture, 2 per cent. Calorific value, 104 calories per ounce. This preparation is intended for the feeding of premature babies, and full term babies and adults suffering from digestive disturbances (inability to digest casein and much fat). Dosage is described in a leaflet. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

'Tannafax' Tannic Acid Jelly.—The inconvenience of preparing fresh solutions of tannic acid, and the deterioration of the solution when stored, have limited its employment as a first-aid treatment for burns. The precipitation of protein by tannic acid and subsequent formation of a firm coagulum are prevented by the application of olive oil and grease, the removal of which is necessary before solutions of tannic acid can be effective.

This unnecessary and harmful delay may be avoided by the use of 'Tannafax' Tannic Acid Jelly. The product is prepared by Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C. It is non-oily and non-greasy and has a water-soluble antiseptic base that can be easily bathed off when medical treatment demands the removal of dead tissues. It is issued in tubes of two sizes, and should prove of value both as a first-aid application and in general routine treatment.

Theelol (Trihydroxy-œstrin).—Theelol is a crystalline ovarian hormone for oral administration, a definite chemical compound closely related in constitution to theelin and possessing the same ovarian-stimulating properties, but distinctive in that it is effective when given orally. For convenience in administration, theelol is supplied in capsules each containing 50 rat units, and is supplied in bottles of 20 capsules. (Parke, Davis & Co., 50, Beak Street, W.1.)

Vagotonine is a new hormone, isolated from the pancreas according to the technique of Santenise and Penaud, which exerts an important regulatory action on the functional activity of the organo-vegetative system. It increases reflex excitability and the tonus of the parasympathetic, and, secondarily, it diminishes sympathetic tonus; it lowers vasoconstrictor tonus and exerts a depressor effect on arterial blood-pressure, which

differs from that of other hypotensive agents in that the fall of blood-pressure is delayed, progressive, and prolonged, and is never followed by a reactionary rise. Vagotonine is indicated in hyperpiesis—40 per cent of all cases of hypertension being amenable to the treatment—in paroxysmal tachycardia, and hyperpinephria.

Treatment should consist of the subcutaneous administration of the contents of 1 or 2 ampoules daily for twenty successive days, each series of injections being separated by a resting interval of twenty to thirty days. The substance is physiologically standardized and supplied in ampoules each containing 2 cgrm. Available in boxes of single (test) ampoules and boxes of six. (The Anglo-French Drug Co. Ltd., 11-12, Guilford Street, London, W.C.1.)

Valitone Elixir.—The ever-increasing demand for a readily eliminated hypnotic combined with valerian in a palatable form, which permits of easily manipulated dosage, can just as easily be met by the British product, Valitone Elixir, as by any of the numerous foreign proprietaries. It is also far more economical.

Each teaspoonful consists of: barbitone soluble $2\frac{1}{2}$ gr., inodorous fluid extract of valerian 3 min., elixir rubra (R. & Co.) q.s.

Valitone is found useful for insomnia, delirium, and as a hypnotic before or after surgical operation. The dose is one teaspoonful to one tablespoonful in a cupful of hot water or aromatic infusion an hour before sleep is desired. (Roberts & Co., 76, New Bond Street, London, W.1.)

Wheat Germ Oil Capsules G.L.—Each of these 3-min. capsules contains the unsaponifiable matter from 5 grm. of freshly extracted wheat germ oil, the richest known source of vitamin E. Their chief field of application is in the case of women who in previous pregnancies have shown a liability to abort in the early months; but in view of the changes found in the gonads of vitamin-E deficient animals there are good reasons for administering this preparation to the male as well. The recommended dosage is one capsule daily, but during the earlier weeks of pregnancy this amount may be increased. (Glaxo Laboratories, 56, Osnauburgh Street, London, N.W.1.)

MEDICAL AND SURGICAL APPLIANCES.

Abdominal Retractors.—The single retractor here illustrated (*Fig. 102*) has been designed by Mr. Ralph Brooke, M.S., for use in operations on the lumbar sympathetic ganglia. It consists of a long, broad blade with a flat lower margin rounded at the edges, and attached to a shaft at right angles. The handle of the retractor makes an angle of 10 degrees from the vertical at its attachment to the shaft, and is faceted for the reception of the thumb. This angulation is an advantage. When the handle is held vertically the lower margin of the retractor is inclined outwards,

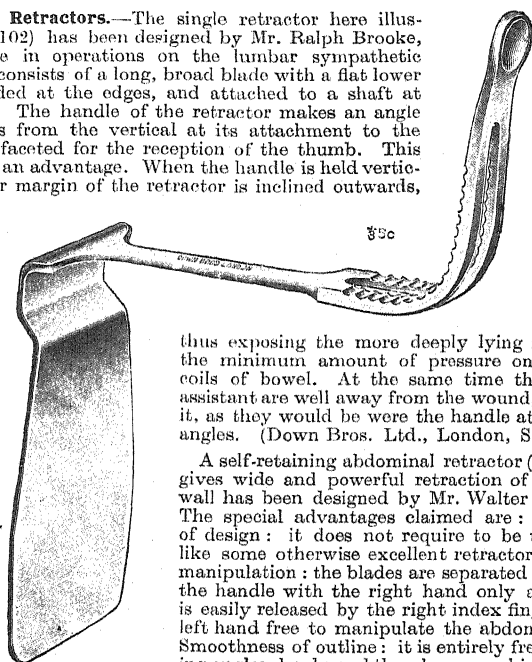


Fig. 102.

thus exposing the more deeply lying structures with the minimum amount of pressure on the overlying coils of bowel. At the same time the hands of the assistant are well away from the wound, and not above it, as they would be were the handle attached at right angles. (Down Bros. Ltd., London, S.E.1.)

A self-retaining abdominal retractor (*Fig. 103*) which gives wide and powerful retraction of the abdominal wall has been designed by Mr. Walter Salisbury, M.S. The special advantages claimed are: (1) Simplicity of design: it does not require to be taken to pieces like some otherwise excellent retractors. (2) Ease of manipulation: the blades are separated by compressing the handle with the right hand only and the ratchet is easily released by the right index finger, leaving the left hand free to manipulate the abdominal wall. (3) Smoothness of outline: it is entirely free from projecting angles, knobs and thumbscrews which may entangle ligatures,

This retractor is useful for gynæcological operations and abdomino-perineal excision of the rectum. A special and unexpected use for the retractor is in performing a cholecystectomy through a paramedian incision. After the hollow viscera have been drawn to the left and covered with a moist gauze pack, the insertion of this self-retaining

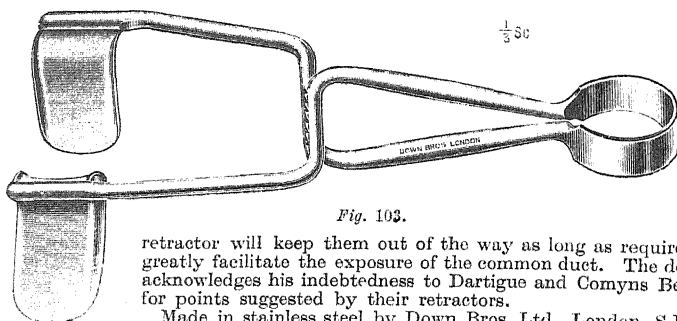


Fig. 103.

retractor will keep them out of the way as long as required and greatly facilitate the exposure of the common duct. The designer acknowledges his indebtedness to Dartigue and Comyns Berkeley for points suggested by their retractors.

Made in stainless steel by Down Bros. Ltd., London, S.E.1.

Artificial Leg.—A natural walk is the aim of every above-knee amputee. The Research department of Desoutter Bros. Ltd., 73, Baker Street, London, W.1, spent many months in the intensive study of slow motion cinematography of the walking

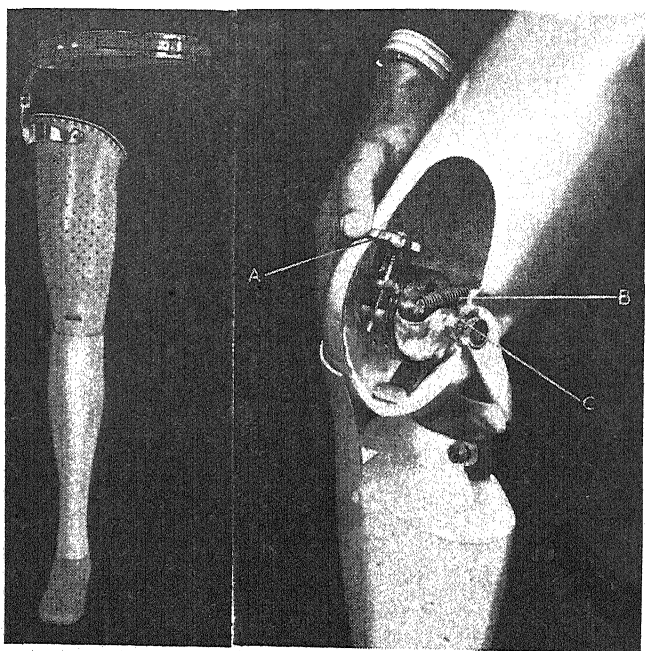


Fig. 104.

action of both natural and artificial limbs. As the result they have achieved this new limb (Fig. 104), with an ingenious wheel control (A), which enables its wearer instantly to adjust the speed of the swing of his knee-joint for fast and slow walking. The high-duty compound ball-bearing knee-joint is seen at (C), and the return spring, which is out of action when sitting, at (B).

The limb is made from seamless pressings, drawn from a flat sheet of 'Alclad'—the strongest corrosion-resisting light metal known. The control wheel of the ball-bearing friction knee is conveniently placed and can very easily be turned through the clothing.

A film may be seen, by arrangement with the firm, showing two men walking, side by side, one of whom is wearing the new limb. It is difficult to discover any difference in their walk. The film also shows the many other activities possible to wearers of Desoutter limbs.

Abdominal Suction Tube.—Designed by Mr. C. E. Kindersley, F.R.C.S., of Bath, this tube (*Fig. 105*) is fitted with an inner one so that in the event of the outer tube becoming blocked, the inner suction tube can easily be removed for cleaning without withdrawing the outer tube. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

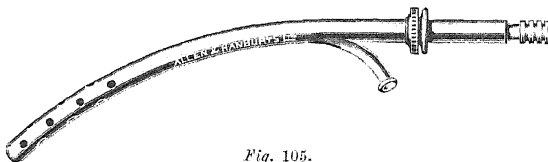


Fig. 105.

Anterior Synechia Knife.—In cases where three-quarters or more of the pupil is incarcerated in a corneal scar, and, as a consequence, the anterior chamber to a corresponding extent is very shallow or practically non-existent, there is often a great deal of difficulty in insinuating the ordinary instruments recommended for the release

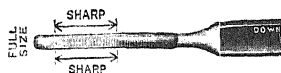


Fig. 106.

operation, like a Graefe's or Herbert's knife or Ziegler's knife-needle, since the sharp point either pierces the cornea or gets entangled in the iris. To obviate this difficulty Dr. C. V. Krishnaswami uses a special knife, the details of which are clearly shown in the illustration (*Fig. 106*). (Down Bros. Ltd., London, S.E.1.)

Bed Rest.—The "Nevaslip" Bed Rest (Patent No. 33032) (*Fig. 107*) is constructed of selected seasoned hard wood and is fitted with a detachable back made of

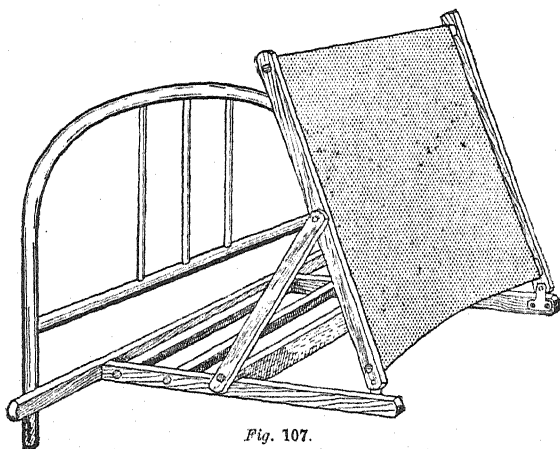
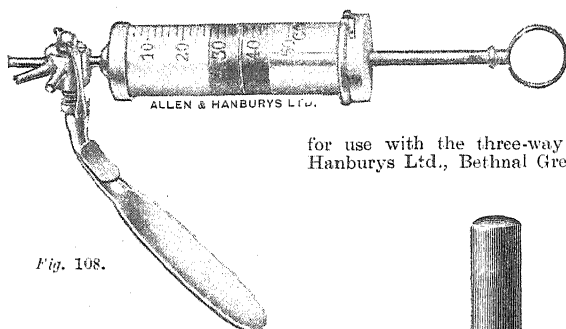


Fig. 107.

washable white duck for comfort. The hinged extension bar, detachable when not in use, prevents slipping. It is adjustable to three positions and is specially designed for hospital service. Supplied unpainted, 10s. each. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London W.1.)

Blood Transfusion Syringe.—With three nozzles for connecting to patient, donor, and saline solution, this syringe (*Fig. 108*) has been designed to obviate the necessity of forcing blood round angled bends and past recesses. There is a direct flow through each nozzle, which obviates coagulation. Syringes of any capacity can be supplied



for use with the three-way apparatus. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Fig. 108.

Blood Transfusion Syringe Container.—The transport of blood in transfusion always presents certain difficulties from the point of view of sterility and the retention of heat. Mr. Hamilton Bailey, F.R.C.S., has designed a container which takes a Denis Browne's or Macintosh's blood transfusion syringe with piston withdrawn. The container (*Fig. 109*) has an upper metal jacket intended to be filled with hot water, and this jacket is still further insulated by a superimposed felt jacket. By this means blood can be taken from a donor and kept at a constant temperature for a period of three to four hours while travelling to a recipient. The makers are Down Bros. Ltd., London, S.E.1.

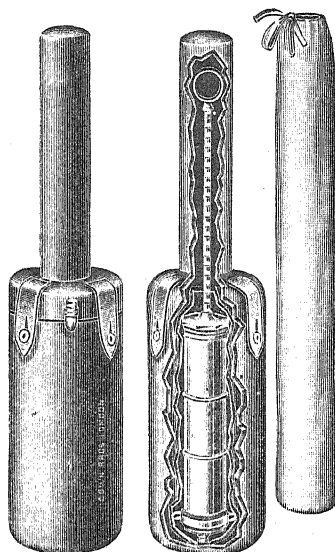


Fig. 109.

Bronchus Swab-holder.—Mr. I. A. Tumarkin, F.R.C.S. (Liverpool), has designed a swab-holder (*Fig. 110*) to obviate the danger of a swab being left in the bronchus. It consists of a hollow handle (E) into which a few yards of $\frac{1}{2}$ in. ribbon gauze is packed, the end being drawn through a narrow tube (A), emerging at the distal end (C). It is absolutely safe: it goes down the narrowest tube, and after use is reloaded in a trice by pulling a further length out and cutting off the soiled end.

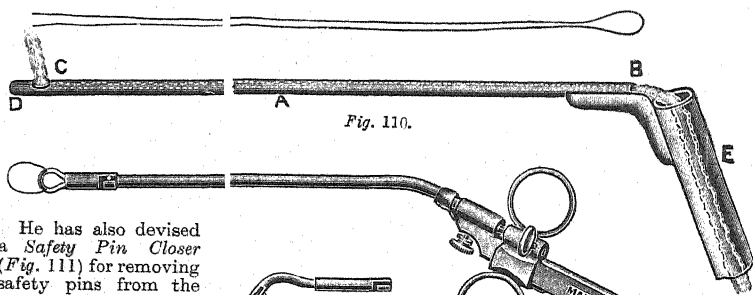


Fig. 110.

He has also devised a **Safety Pin Closer** (*Fig. 111*) for removing safety pins from the oesophagus. This is a modification of Attwood Thorne's snare. In use the pin is fixed by forceps or hook, and

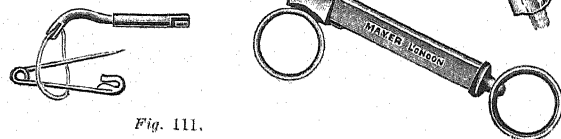


Fig. 111.

the snare is passed with the loop closed until it is beyond the pin. The self-looping fitment causes the wire when extended to form a loop at right angles to the stem, and after passing over the pin closes it when the loop is withdrawn. (Mayer & Phelps, 'Chiron House,' New Cavendish Street, London, W.1.)

Cannula for Bartholin's Glands.—The illustration (*Fig. 112*) shows a silver cannula designed by Mr. A. Allport M.R.C.S., L.R.C.P., for injecting Bartholin's glands with acriflavine, weak silver nitrate, etc. It will fit on to any standard hypodermic syringe and is made by Down Bros. Ltd., London, S.E.1.



Fig. 112.

(Catheter De Pezzer).—Dr. Nicholson, of West Hartlepool, writes:

The modified De Pezzer Catheter (*Fig. 113*) has been made for me by Chas. F. Thackray, of Leeds. It is sometimes necessary for a patient to have prolonged suprapubic drainage of the bladder. Some type of self-retaining catheter is necessary and the De Pezzer type is often employed for this, but there is considerable difficulty in keeping the ordinary form in position if the patient is moving about. Tapes or strapping wound round the catheter are sometimes used, but this is not very satisfactory and the patient usually experiences the discomforts of leaking from the catheter being extruded from the bladder.

In this modification a wide flap of rubber $\frac{1}{2}$ in. thick extending 3 in. either side is used on the catheter and extends at right angles over the front of the abdomen. A dressing of gauze is placed between the flap and the abdominal wall, and the sides of the flap are secured by broad strapping. Any size of catheter can be supplied. The usual position of the flap is $3\frac{1}{2}$ in. to 4 in. from the tip of the catheter.

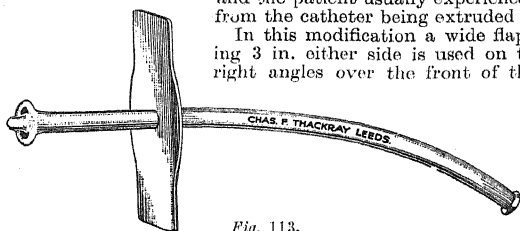


Fig. 113.

This position has been found best in most cases, but the distance can be modified to suit a particular case. A suitable lead can be arranged from the catheter to a bottle if the patient is in bed, or to a small bottle carried in the pocket if moving about. The advantages claimed are that the catheter is comfortable to wear, does not come out, and allows the patient to pursue his normal activities. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Catheterization (Retrograde).—The illustration (*Fig. 114*) shows an instrument which has been devised by Mr. H. L. Attwater, F.R.C.S., for retrograde catheterization

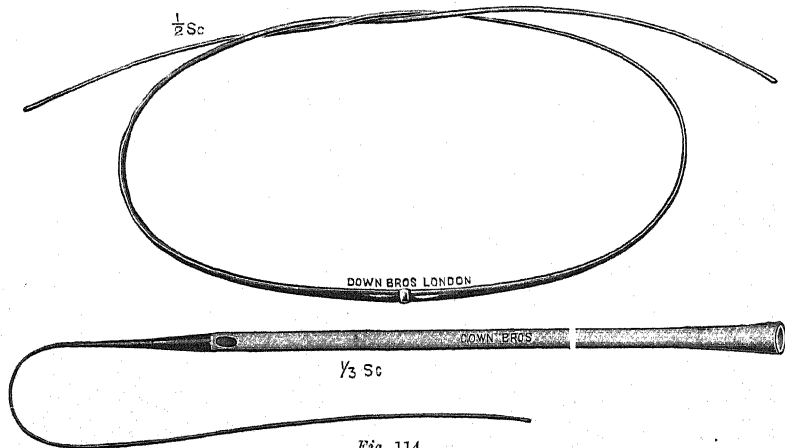


Fig. 114.

of the urethra. Two Ryall's filiform bougies with sunken mounts are connected by means of double screw union. This jointed guide is then passed from the bladder through to the urethra. When the tubing merges it is a simple matter to pull the instrument through until the jointed connection appears. The union is then removed and an ordinary Ryall silk-web catheter is screwed on to the guide which remains in the urethra. The catheter is now pulled through the urethra by means of traction on its guide. The instrument is made by Down Bros. Ltd., London, S.E.1.

Cautery Handle.—There are a number of cautery handles on the market, but few of them can be handled with the delicacy and lightness of touch which ought to be a special feature of any instrument intended to be used on the eye. Many ophthalmic

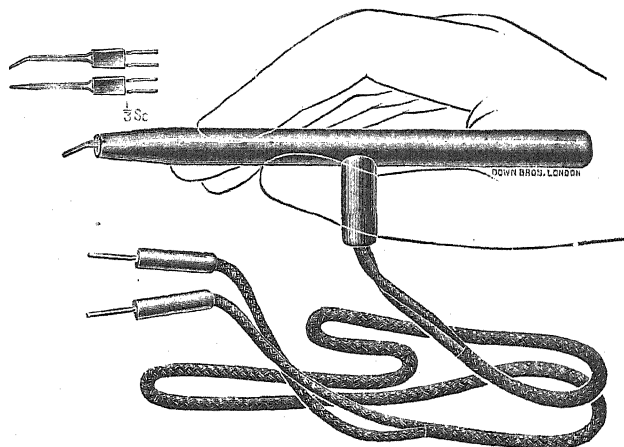


Fig. 115.

surgeons of experience consider that where possible the instruments with which they perform the delicate manœuvres employed in operations on the globe, should be long-handled and capable of being held like a pen, pencil, or brush, with which the average individual is enabled to execute the finest movements for which delicate touch is required.

The handle here illustrated (Fig. 115) was made with this idea in view for Lt.-Col. R. E. Wright, C.I.E., I.M.S., by Down Bros. Ltd., London, S.E.1.

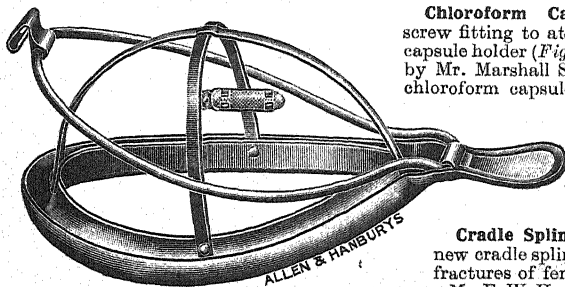


Fig. 116.

Chloroform Capsule Holder.—With screw fitting to attach to any mask, this capsule holder (Fig. 116) has been designed by Mr. Marshall Scott, of Exeter, to hold chloroform capsules, and is fitted with a breaker so that the capsule is readily broken under the mask. (Allen & Hamburys Ltd., Bethnal Green, London, E.2.)

Cradle Splint.—We illustrate here a new cradle splint (Fig. 117) for traction fractures of femur or leg bones.

Mr. E. W. Hey Groves, M.S., F.R.C.S., writes: A single pattern has taken the place of the original types of cradle splints. The upper part is cut away to give room for the bedpan, and two double sets of pulley wheels are provided to give a multiplied traction in different directions. It is a self-contained piece of apparatus which provides for efficient traction treatment of the worst type of leg fractures, and yet is sufficiently light and compact to be easily taken about. Two other little improvements have helped this ideal of efficiency and compactness; first, the use of multiplying pulleys, two attached to the leg and two

to the splint, by which the traction weight can be increased up to fourfold; and the second, a neat 10-lb. weight made like a large bobbin, which serves to wind up all the slack cord and which can be made fast at any point. The makers are Down Bros. Ltd., London, S.E.1.

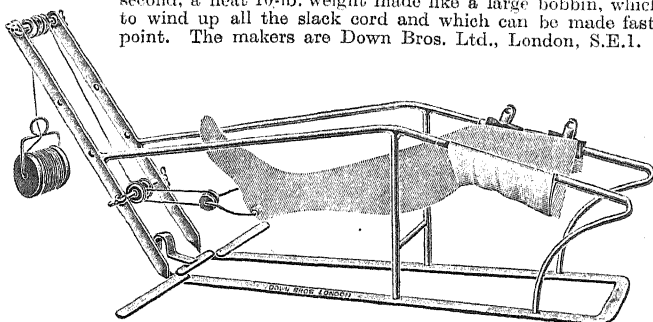


Fig. 117.

Cystitome Scissors.—These cystitome scissors (*Fig. 118*) were devised by Mr. R. P. Ratnakar, F.C.P.S., D.O.M.S. The main idea was to make the outer edges and the point of De Wecker's scissors sharp, so that with closed blades the surgeon can pierce the cornea

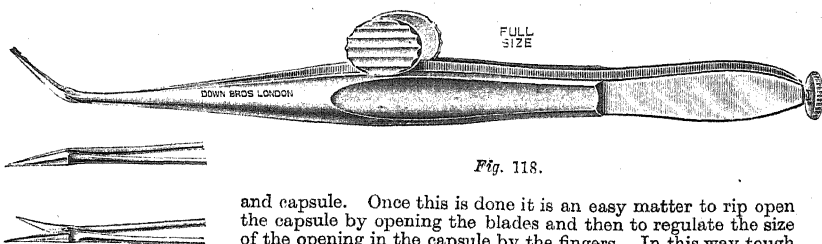


Fig. 118.

and capsule. Once this is done it is an easy matter to rip open the capsule by opening the blades and then to regulate the size of the opening in the capsule by the fingers. In this way tough capsules which have resisted the sharpest knives can be easily cut, and, the force applied being centrifugal, there is no drag on the ciliary body, and therefore no danger of subsequent inflammation. The puncture in the cornea is also very small and heals up rapidly. These cystitome scissors are also very useful for iridotomies. (Down Bros. Ltd., London, S.E.1.)

Diagnostic Set.—The Klinostik Compact Diagnostic Set (*Fig. 119*) fully satisfies the demand for an electric diagnostic set of small bulk and yet containing all the necessary instruments. This has been made possible by arranging the various instruments in an ingenious folding tray case, and the result is a remarkable and most efficient outfit. Though the compact set is only half the size of the ordinary model, the contained instruments are equally accessible.

The latest type of May electric ophthalmoscope shares a tray with throat and post-nasal mirrors and spare bulb; a daylight electric auriscope with three different size specula and an expanding nasal speculum occupies the other. The lower part of the case contains the Klinostik standard battery handle, fitted with clip and adjustable rheostat to control

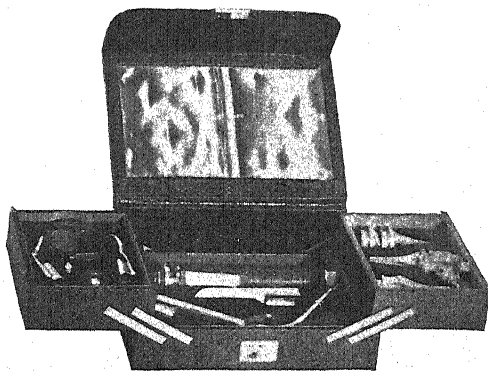


Fig. 119.

the intensity of the light, and an angled laryngeal rod with lamp and two different types of tongue depressor, one to take popular wooden blades. The price, £5 12s. 6d., is no more than that of an ordinary set and the advantages are obvious. It is the ideal set for the progressive general practitioner. The makers claim that a Klinöstik electric diagnostic set is "as indispensable as the stethoscope", and we feel certain that anyone who uses it will never go back to the 'indirect' method.

The Klinöstik Compact can be purchased from any surgical house in Great Britain or the Colonies. The difficulty of obtaining batteries by colonial and foreign users has been overcome by making special handles to fit batteries available in every country. A special model has been made to take Canadian and American cells, and the makers not only guarantee the set, but they are prepared to arrange for a regular supply of batteries to users in outlying districts. The makers are John Smith & Son (Glasgow) Ltd., 26-30, Gibson Street, Hillhead, Glasgow.

Diathermy Apparatus.—The 'Thermoset' Senior Diathermy, the latest product of Electro-Medical Supplies, is certainly most worthy of consideration by those contemplating the purchase of such an apparatus. It has been thoroughly tested and approved by the Medical Officers of the Electrical Department of St. Bartholomew's Hospital, London, for both medical and general surgical diathermy, including the treatment of gonococcal infection.

Special attention has been paid to the design of the components in order that the apparatus will function for long periods without attention.

The spark gap consists of six pure tungsten targets electrically welded to large copper supports, which are in turn fitted with a number of radiating fins to dissipate the heat.

The static transformer is of the closed-core type and double wound to ensure maximum efficiency.

The condensers are scientifically constructed with best quality ruby mica insulation, and are manufactured throughout in the Electro-Medical Supplies' own works.

Very smooth regulation of the output is provided by use of a vario-coupler allowing a full 180 degrees movement, ensuring a very gradual increase of current from zero to maximum. (Electro-Medical Supplies, 209b, Great Portland Street, London, W.1.)

Ear Operating Set.—Sprague's Vest Pocket Ear Operating Set is composed of six useful instruments fitted into a neat circular rack which slides into a screw-capped circular case. The whole is chromium plated, price 21s. (Reynolds & Branson Ltd., 13, Briggate, Leeds.)

Examination Lamps.—These beautifully made pencil lamps (*Fig. 120*) are of black or opal glass with lens tip for mouth examination, transillumination, etc. They are

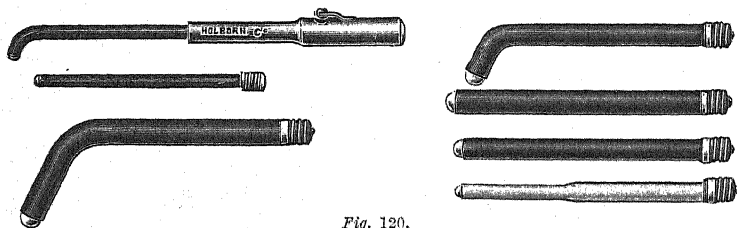


Fig. 120.

made straight or bent, and fit the ordinary Ever Ready pocket torch. The extra slender type is most useful for nasal examination. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E.C.1.)

Fascia Needle.—The crocodile jawed fascia needle illustrated in *Fig. 121* was



Fig. 121.

designed by Mr. Kenelm H. Digby, F.R.C.S., to simplify the operation of passing a fascia strip. The end of the strip is passed into the 'crocodile jaw' of the needle. This jaw is then squeezed together by means of any convenient forceps. The needle is then loaded ready for operation. (Down Bros. Ltd., London, S.E.1.)

Foot Supports.—Messrs. Salmon Ody Ltd., 7, New Oxford Street, London, W.C.1, bring to our notice their *Spiral Spring Arch Supports* for flat-foot. They are light in weight, resilient, and support the side of the foot as well as the arch, while the

springs exert a gentle massage effect. Most important of all, they can be adjusted in height so that the maximum of comfort is secured with ease.

Salmon Ody Ltd. have also a special support for the metatarsal arch, consisting of an inverted spoon-shaped piece of metal fixed at the front part of the leather sole, so forming a combination support for both the main and transverse arches.

Krector Foot Support.—The perfect fitting of valgus soles or foot supports has always been difficult owing to the absence of a suitable means of taking the correct measurements of the foot and, above all, of obtaining the necessary information for applying the exact amount of correction at the points required.

The 'Krecto' Chart supplies a convenient and ideal way of taking a perfect impression of the foot which will give all the necessary details so that a support can be made to suit each individual case.

A supply of charts and full particulars of the 'Krector' Foot Support will be sent on application to Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.

FORCEPS.

Capsule Forceps.—A new forceps (*Fig. 122*) for intracapsular extraction of cataract has been devised by Mr. R. P. Ratnakar, F.C.P.S., D.O.M.S. The forceps is made of stainless steel and is given a double curve at the end, so that without undue depression it is easily brought to bear on the anterior surface of the lens. At each end there is a bisected cup, and on closure of the blades there is perfect apposition of the two cups. The tips are blunt so that there is no danger of injuring the capsule.

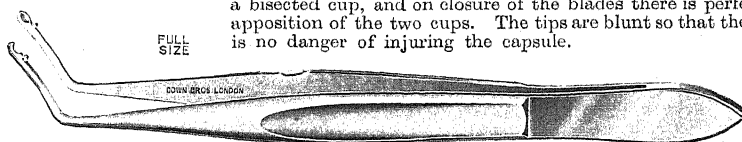


Fig. 122.

When the capsule is caught between the cups it forms a knuckle which can be easily seen through the cornea. Once the capsule is gripped it seldom slips or tears provided the cataract is of a suitable variety for intracapsular extraction. (Down Bros. Ltd., London, S.E.1.)

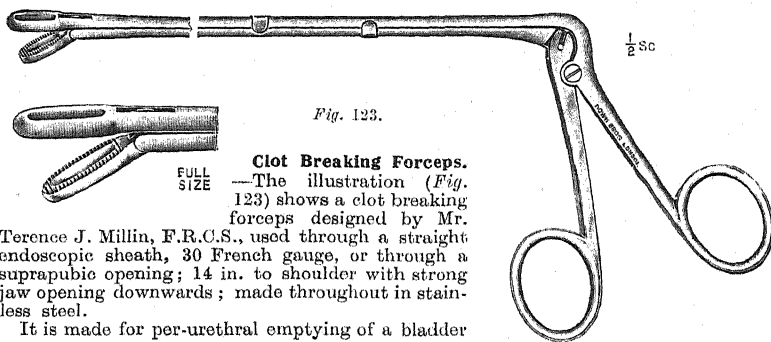


Fig. 123.

Clot Breaking Forceps.

—The illustration (*Fig. 123*) shows a clot breaking forceps designed by Mr. Terence J. Millin, F.R.C.S., used through a straight endoscopic sheath, 30 French gauge, or through a suprapubic opening; 14 in. to shoulder with strong jaw opening downwards; made throughout in stainless steel.

It is made for per-urethral emptying of a bladder

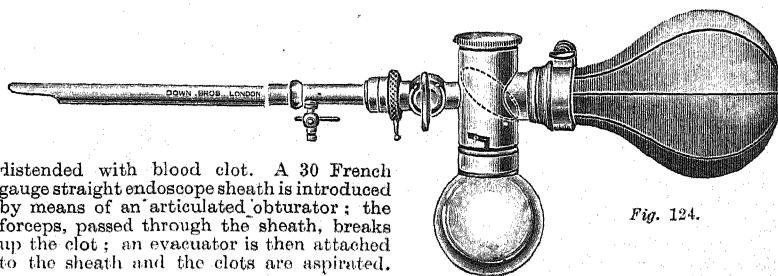


Fig. 124.

distended with blood clot. A 30 French gauge straight endoscopic sheath is introduced by means of an articulated obturator; the forceps, passed through the sheath, breaks up the clot; an evacuator is then attached to the sheath and the clots are aspirated.

A special telescopic attachment is available for use with the same sheath, allowing inspection of bladder and urethra under continuous irrigation.

The second illustration shows Canny Ryall's Evacuator (*Fig. 124*) attached to the straight-ended endoscopic sheath for completion of the operation. The makers are Down Bros. Ltd., London, S.E.1.

Disc Forceps.—A new disc forceps (*Fig. 125*) has been designed by Mr. H. M. Traquair, F.R.C.S., for grasping the scleral disc in trephining, or the edge of the sclera or cornea under other circumstances. They are made on the same principles as the iridotomy forceps noticed on page 567. (Down Bros. Ltd., London, S.E.1.)



Fig. 125.

Entropion Forceps.—Dr. Gordon W. Spencer, of Iraq, writes: When operating for entropion I found that Ratnakar's forceps could not be used in a large number of cases because of their prominent apex, which, owing to the atrophy which occurs at the fornix of trachomatous cases, rendered their proper adjustment impossible.

Down Bros. Ltd., London, S.E.1. made to my design the forceps illustrated here (*Fig. 126*), having the following advantages:—

1. The rounded blade enables them to be fitted into any eye, no matter how small the conjunctival sac.

2. Access is obtainable into the extreme angles of the lid, usually the points of most marked entropion. A much longer

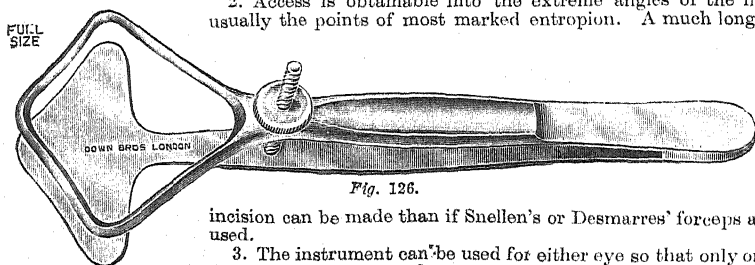


Fig. 126.

incision can be made than if Snellen's or Desmarres' forceps are used.

3. The instrument can be used for either eye so that only one forceps is necessary and not two.

4. Bleeding is as satisfactorily controlled as by the use of any other forceps, and there is no interference with the needle in putting in any form of stitches.

5. The instrument can be used for any operation on the lid for which the other forms of forceps are applicable, i.e., Heisrich's, etc.

6. The forceps are made in several sizes for varying lids.

These forceps have now been used for over 1000 entropion operations and have proved entirely satisfactory.

Epilation Forceps.—This is an improved (spring pattern) forceps for the easy removal of hair. By pressing the knob at the bottom of the handle the blades spring back with the extracted hair. To set the forceps push down the top knob. (Donald M. Gaw, Chapel Walks, Liverpool.)

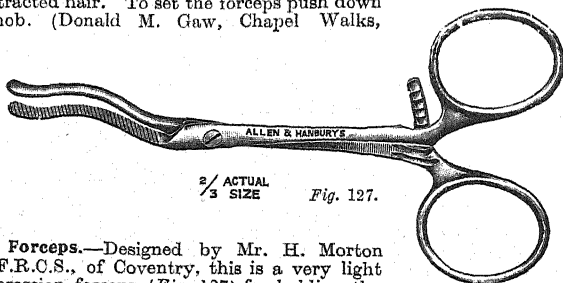


Fig. 127.

Hare-lip Forceps.—Designed by Mr. H. Morton Anderson, F.R.C.S., of Coventry, this is a very light spring compression forceps (*Fig. 127*) for holding the upper lip and controlling hæmorrhage during hare-lip operations. (Allen & Hanbury's Ltd., Bethnal Green, London, E.2.)

Iridotomy Forceps.—Mr. H. M. Traquair, F.R.C.S., has designed a new iridotomy forceps (*Fig. 128*) intended for peripheral iridotomy or iridectomy in cataract and glaucoma operations. The teeth are pointed downwards so as to ensure catching the iris, and reliability is conserved by making the instrument strong right up to the points. The makers are Down Bros. Ltd., London, S.E.1.



Fig. 128.

Needle Sterilizing Forceps.—These are beautifully made, chromium-plated, box joint forceps. The ends of the blades are curved and grooved to facilitate the picking up of needles and small instruments. The price is 8s. 6d. (Reynolds & Branson Ltd., 13, Briggate, Leeds.)

Placenta Prævia Forceps.—Willett's forceps, despite their great usefulness for the treatment of the very difficult case of placenta prævia where the os is small and the vertex presenting, have one definite disadvantage. When the head is floating it is at times very difficult to catch the scalp in the teeth of the forceps, in spite of the help of an assistant's hand on the abdomen. Reid's instrument here illustrated (*Fig. 129*), is an attempt at overcoming this difficulty by a number of modifications.

The forceps are toothed similar to Duval's lung grasping forceps, except that the teeth are exaggerated and cut after the manner of a saw, the end ones being slightly accentuated at the ends of the curve. One set is at 90° to the shank to grasp the scalp quickly when the forceps

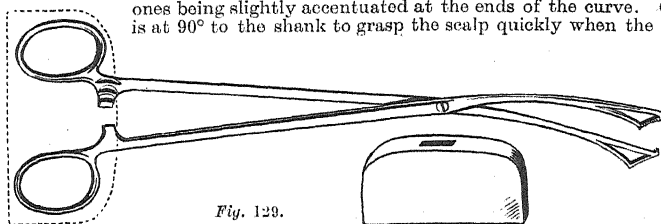


Fig. 129.

close; the other set is 45° to hold it when caught. The toothed ends are curved, forming part of a 5-in. circle, in order to conform with as many planes of the foetal skull as possible. A weight of convenient shape is provided and fits over the bows (see dotted line). Price: carbon steel, chrome plated, 34s. 9d. each, or in rustless steel, 42s. 3d. each. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

Sigmoidoscope Forceps.—Designed by Frankenfeld, of New York, this forceps (*Fig. 130*) is devised for holding swabs or for taking small specimens of growth for microscopical examination. The opening and closing of the jaws is operated by a spring handle. Normally the jaws are closed, and when it is desired to open them it is only necessary to compress the handle. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

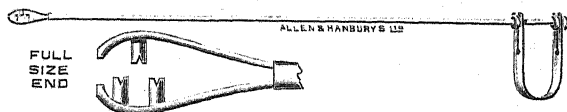


Fig. 130.

Sterilizer Forceps.—This forceps has been designed for removing both hypodermic and serum syringes from the sterilizer. Its usefulness may be understood from the illustration (*Fig. 131*). Price: carbon steel, chrome plated, 7s. each. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

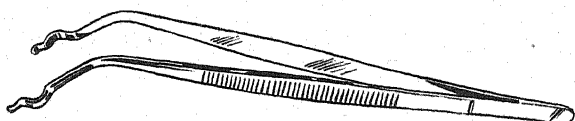


Fig. 131.

Stitch Marking Forceps.—A very useful instrument is here illustrated (*Fig. 132*), for marking the skin to effect even suturing. The dull points are arranged so as to give alternate markings by following up the last mark made by the twin points with the point of the double prong. Price: carbon steel, chrome plated, 8s. 6d. each. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)



Fig. 132.

Tonsil Forceps and Dissector.—These have been designed by Mr. C. P. Robinson, F.R.C.S. (Swansea). The Tonsil Vulsellum Forceps (*Fig. 133*), by virtue of its serrated and cupped end, enables one to get a firm grip of the tonsil and to draw it from its bed and thus facilitates its removal.

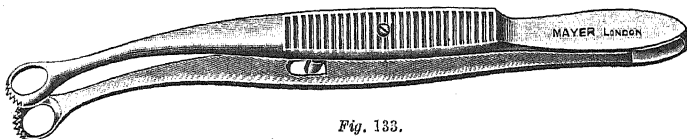


Fig. 133.



Fig. 134.

The Dissector (*Fig. 134*) will be found most useful in the dissection of tonsils. The sharp end is used to divide the mucosa close to the anterior pillar and to expose the capsule, while the flat blunt end is used to follow the exposed capsule down to the base of the tonsil. This can be done with the minimum of trauma. (Mayer & Phelps, "Chiron House," New Cavendish Street London, W.1.)

Tonsil Hæmostatic Forceps.—In the self-retaining tonsil hæmostatic forceps (*Fig. 135*), devised by Mr. W. T. Milton, M.S., there are two separate blades, each carrying a swab-holder, which are introduced separately, the right first. When the swabs are nicely 'home' in the tonsillar fossæ, the blades are easily locked, and firm, continuous pressure can be exerted upon the bleeding fossæ by appropriation of the ring grips—the ratchet, of course, preventing any relaxation until this is desired. Disengagement

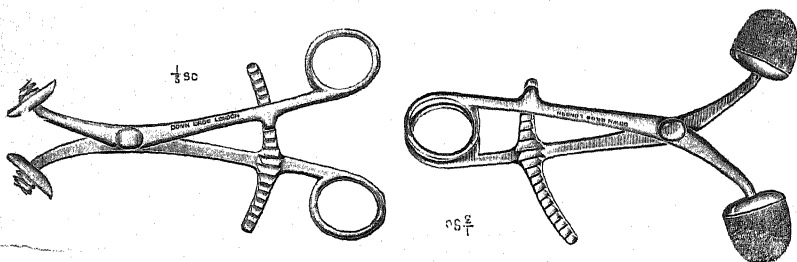


Fig. 135.

is easy, two or three notches only being needed to reduce the counter-pressure of the tonsillar fossæ on the swabs, and then the upper member (the left) can be withdrawn directly outwards (from the mouth) by reason of the obliquity of its engaging slot.

The swab-carrying mechanism consists of a twin cylindrical 'corkscrew' rising from a saucer-shaped base, in which each swab is efficiently supported. It is necessary that the swabs should not only be of a size likely to fit the fossæ, but should be tightly

packed, with no hint of flabbiness; and the corkscrew points should be engaged at a little distance from the twisting and tying pole of the swab, so that there is little resistance to the penetration of the corkscrew points. The ratchet arm has been carried across the shaft of the first blade to allow for exceptionally wide throats. The makers are Down Bros. Ltd., London, S.E.1, to whom the inventor is indebted for at least one valuable modification in the design.

Tonsil Holding Forceps.—This forceps (*Fig. 136*), designed by Dr. T. H. R. McKiernan, is nothing more than a modification of Duval's peritoneum pattern. The blades are curved to almost a right angle with the handle, so that when the tonsil is grasped there is ample room for the use of scissors or other instruments to carry out the enucleation. It has some advantages inasmuch that the tonsil is held firmly and may be drawn well out of the tonsillar fossa. No damage is inflicted on the tonsil and the view of the operation field is not restricted. It is extremely light and in practice works well. It would be advisable to have a smaller size for use with children. Down Bros. Ltd., London, S.E.1, are the makers.

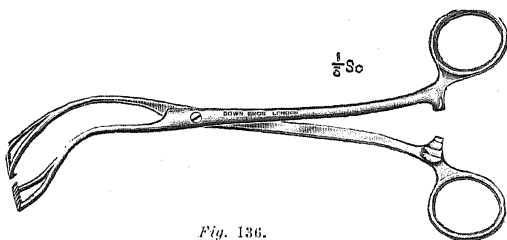


Fig. 136.

Upper Fixation Forceps.—Dr. D. Priestley Smith has devised a new upper fixation forceps (*Fig. 137*) for fixing the eye in cataract extraction. One foot is placed on the upper limbus and the other 5 or 6 mm. higher up on the globe. They are then closed. This gathers up the intervening conjunctiva to the limbus, where it forms



Fig. 137.

a fold or pleat held at its base in the forceps. This affords very good fixation. The corneo-scleral section is now made forthwith, the knife cutting out immediately behind the feet of the forceps, i.e., through the posterior layer of the conjunctival fold. This procedure makes a good conjunctival flap. The makers of this instrument are Down Bros. Ltd., London, S.E.1.

Fracture Stirrup.—This modification (*Fig. 138*) of Kirschner's stirrup, designed by Dr. N. A. Kinnear for use in his system of piano-wire extension of fractures, seems to have advantages over some other types of stirrup. The threading of the wire through the stirrup is simple, and it is impossible to twist and so fracture the wire

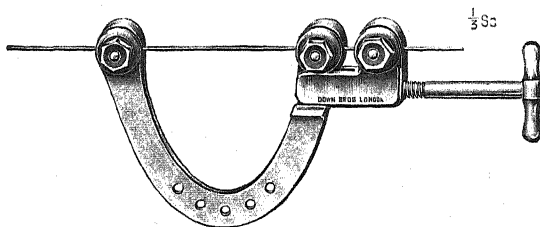


Fig. 138.

while tightening it. The wire is securely and rigidly held in the stirrup by the end-piece lock-nuts. The stretcher is detachable and only one is necessary for any size or number of stirrups, expense thus being reduced. There are two alternative sizes of end-piece nuts and five sizes of stirrup to suit the olecranon, the tibial tubercle, the calcaneus, or the lower end of the femur. In practice it will be found that two sizes of stirrup will be sufficient. The instrument is reasonably priced, and is made by Down Bros. Ltd., London, S.E.1.

Guillotine (Hæmostatic).—There are two blades incorporated in O'Malley's modified guillotine (*Fig. 139*), one for crushing the tonsil, the other for cutting through. The crushing blade is first driven home by the handle operating on a ratchet at the base, after which the sharp blade is operated by thumb pressure on the special T piece fitted to the end. The risk of hæmorrhage when using this instrument is very slight, and release of both blades may be obtained by pressure of the little finger on the ratchet. (Donald M. Gaw, Chapel Walks, Liverpool.)

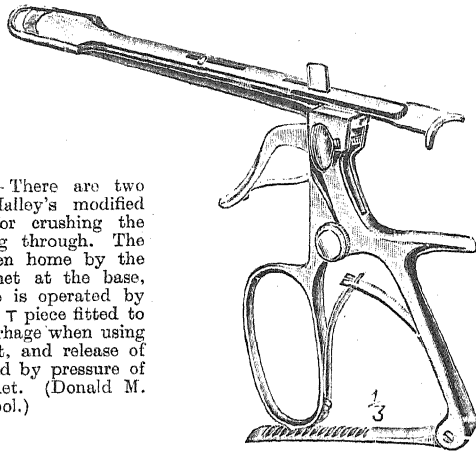


Fig. 139.

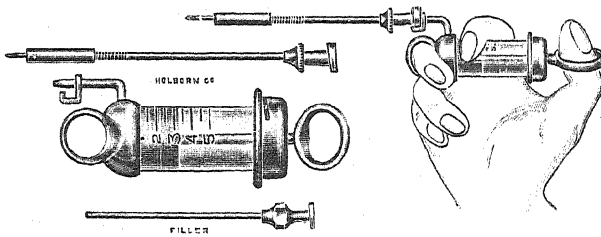


Fig. 140.

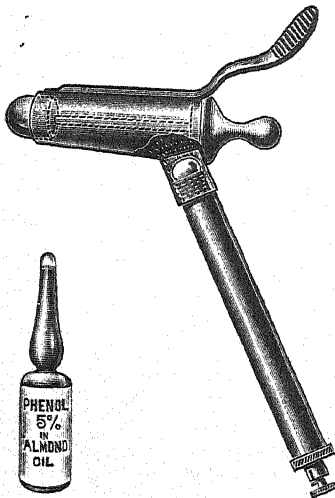


Fig. 142.

Fig. 141.

Hæmorrhoid Injection Syringe and Rectoscope.—This useful outfit for submucous injection treatment of hæmorrhoids contains, in a nickel-plated metal case:—

(1). An improved model Syringe (*Fig. 140*), completely controlled with one hand, and one Morley's stainless steel needle with screw stop and guard and syringe filling pipe.

(2). Holborn Rectoscope (*Fig. 141*) with battery and lamp in detachable handle. A glass window in the floor of the speculum protects the lamp and a removable slide facilitates examination.

(3). Box of six 1 c.c. ampoules 5 per cent solution phenol in almond oil (*Fig. 142*).

The outfit sells with a 3-c.c. syringe at £3 3s., or with a 5-c.c. syringe at £3 5s. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E.C.1.)



Hæmostatic Bag.—Mr. Terence J. Millin, F.R.C.S., designed a hæmostatic bag (*Fig. 143*) for use in transurethral prostatectomy. This apparatus consists of an inflating bag mounted on an open-end catheter which is introduced through the sheath

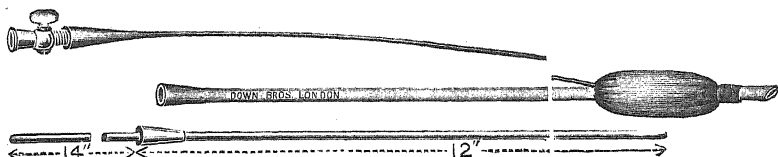


Fig. 143.

of the prostatic resectoscope by means of a stainless steel stilette. It is used for those cases in which it is necessary to control hæmorrhage after prostatic resection, and is designed to permit continuous bladder drainage while *in situ*. (Down Bros. Ltd., London, S.E.1.)

Hæmostatic Bag Retainer.—The illustration (*Fig. 144*) shows a retainer for hæmostatic bag devised by Mr. Terence J. Millin, F.R.C.S. It is strapped to the legs below

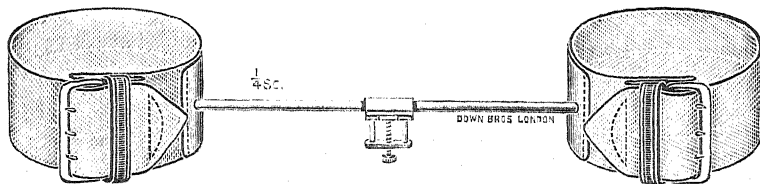


Fig. 144.

the tibial tuberosities, and presents several advantages over the perineal cage type retainer. (Down Bros. Ltd., London, S.E.1.)

Hallux Rigidus Splint.—It is customary to apply a hallux valgus splint after operating for hallux rigidus. As the aim of the operation is to procure dorsiflexion of the big toe which has been lacking, Mr. R. Wood Power, F.R.C.S., has designed a splint (*Fig. 145*) to hold the toe in this position. The structures beneath the joint have long been contracted as a result of disuse, and by placing the toe in the dorsiflexed position these structures are kept on the stretch and any further tendency to contraction is prevented.

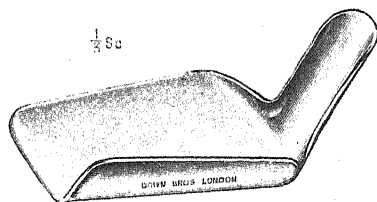


Fig. 145.

The splint is made of aluminium by Down Bros. Ltd., London, S.E.1, and consists of a toe-piece almost at right angles to the body; to this the toe is strapped with adhesive plaster after the operation. The body of the splint fits to the forepart of the sole and its inner edge is raised to grasp the inner border of the foot, adhesive strapping securing it in position. There are right and left splints which are made in two sizes, one to fit the male foot and the smaller to fit the female.

It is found that, since placing the toe in the dorsiflexed position after operation, the patient experiences much less pain when movements are started, the results on the whole being better and recovery more rapid.

Hallux Valgus Splint.—This splint (*Fig. 146*) is designed by Mr. R. Wood Power, F.R.C.S., and is a modification of Jones's splint, which is often found difficult to keep

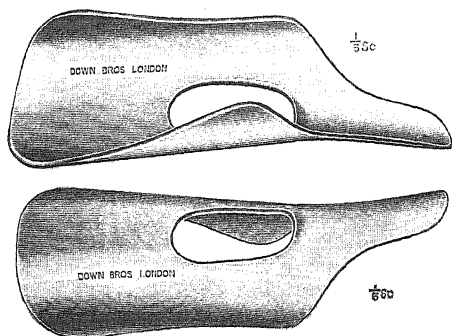


Fig. 146.

piece with adhesive strapping. A second piece of strapping surrounds the forepart of the foot and the body of the splint. No further dressing or bandage is required. (Down Bros. Ltd., London, S.E.1.)

Heel Supports.—These have been designed by Dr. Cecile Booysen. The addition of these heel supports (*Fig. 147*) to a couch is of great assistance in the gynaecological and rectal examination of patients. (Allen & Hanbury Ltd., Bethnal Green, London, E.2.)

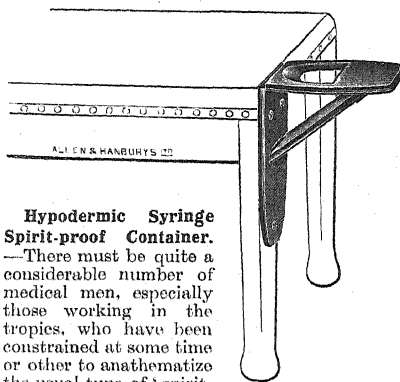


Fig. 147.

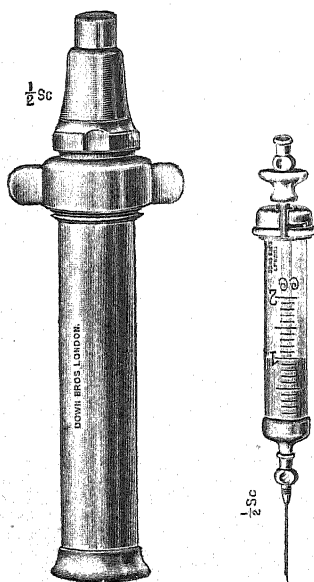


Fig. 148.

Hypodermic Syringe Spirit-proof Container.

—There must be quite a considerable number of medical men, especially those working in the tropics, who have been constrained at some time or other to anathematize the usual type of 'spirit-proof' container for hypodermic syringes.

Dr. H. M. Stanley Turner, Wing-Com. R.A.F., has designed a holder (*Fig. 148*) which has stood up to extremely severe tests. The cap fits on to the container by means of a long taper and is held in position by a detachable butterfly union nut. This mode of construction permits of the cap being accurately 'ground-in', so that an absolutely spirit-proof joint can be obtained. It is not necessary to screw the union nut down tightly, as it only has to hold the cap in position. A mere flick is sufficient.

To avoid all risk of the cone sticking, the act of unscrewing the union nut effects a 'primary extraction' by separating the male and female halves. The union nut beds into a layer of white metal on the cap and does away with the need for washers. The makers are Down Bros. Ltd., London, S.E.1.

Instrument Case.—This is a round spirit-proof metal case for minor surgery (*Fig. 149*), about 6 in. \times 4 in., with a removable rack containing scissors, artery forceps, dissecting forceps, trocar and cannula, scalpels, needles, etc. The case is fitted with a screw cone-fitting lid which renders the case spirit-tight, and the instruments, being immersed in spirit, are in a sterile condition and ready for immediate use. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

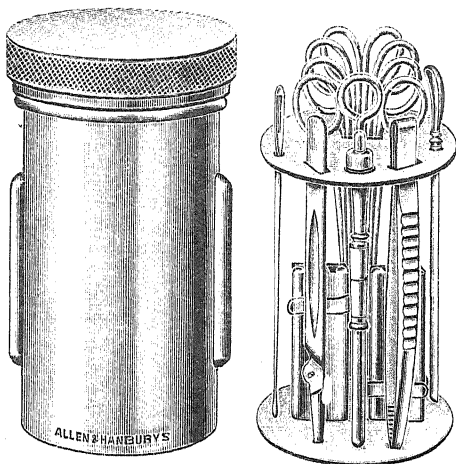


Fig. 149.

Instrument Tray.—The new surgical instrument tray illustrated (*Fig. 150*) possesses several advantages over the ordinary type. It is made of best white porcelain, 16 in. \times 12 in., with rounded corners and sloping sides, and is thus easily washed and sterilized. Moulded partitions divide the tray into five compartments, so that instruments may be kept separate, the small divisions being particularly useful for surgical needles.

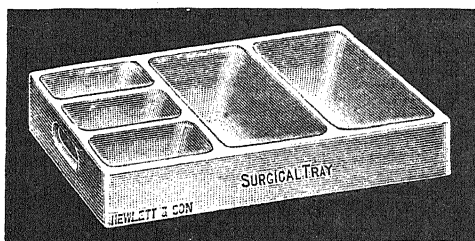


Fig. 150.

Kidney Capsule

Knife.—Designed by Mr. H. Morton Anderson, F.R.C.S., of Coventry, this knife (*Fig. 151*) has a blunt point, and is useful for slitting the capsule of the kidney without damaging the kidney itself. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

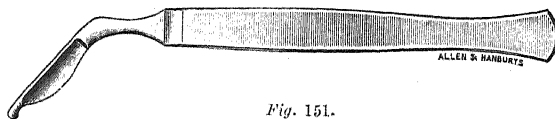


Fig. 151.

Knives with detachable Blades.—The 'Thackray' S.O.S. Knife (Pat. No. 397, 655), with detachable blades (*Fig. 152*), has been specially designed to give safe operative



Fig. 152.

sharpness. A variety in the shapes of the blades meets all the surgeon's needs, while

the blades are inserted and detached with the greatest of ease. Every blade is tested so that a perfectly sharp edge is assured. This knife is of British make throughout, from the finest selected and tempered steel. (*See Advt., p. xiii.*) Manufactured by Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.

Lens Expressor or Hook.—Dr. R. P. Ratnakar has designed a hook or lens expressor (*Fig. 153*) which is like an ordinary tenotomy hook with a knob at the end; but the curve is so modified that gentle pressure can be easily applied in a desired direction without interference from the surrounding parts. This expressor is made by Down Bros. Ltd., London, S.E.1.



Fig. 153.

Ligature Scissors.—Mr. C. Alex. Wells, F.R.C.S. (Liverpool) writes: The ligature scissors shown in the accompanying figure (*Fig. 154*)—by kind permission of the *British Medical Journal*, and which Mr. Chas. F. Thackray, of Leeds, has made for me, are peculiar in that the blades are disproportionately long, which results in a bigger movement at the points than occurs at the rings. The shanks are made bow-legged, and in

between them a spool of thread is carried. This turns upon a spindle, which screws into a block fixed to one of the rings and can be changed with ease.

The scissors are carried on the ring and little fingers of the operator's right hand, in the palm of which they lie, the points emerging between the forefinger and thumb. Some surgeons might consider it worth while having the spools wound with catgut, but personally I use the scissors only with thread, which is previously put through the autoclave. At the time of operation the scissors and thread are boiled up together with the other instruments, and, using a rustless steel pair, I have not found it necessary to re-sharpen the blade even after two years' constant use in all such perfectly clean and extensive operations as a radical breast, thyroidectomy, or gastrectomy. I cut the knots very short and have had no difficulty from the discharge of fragments, except in one thyroidectomy. The amount of thread contained in one spool is sufficient for any one of these operations.

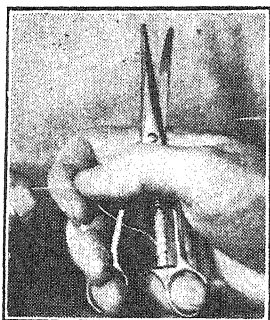


Fig. 154.

A considerable economy in catgut is effected, but the real value lies in the time saved when the surgeon ties and cuts his own ligatures, more especially if a regular trained assistant is not always available. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Lobectomy Tourniquet.—In *The British Journal of Surgery*, October, 1933, p. 277, is an article on "Pulmonary Lobectomy," by Roberts and Nelson.

The authors describe a new tourniquet (*Fig. 155*) consisting of a tube which is oval in section, 9 in. long, and bent in the middle to an angle of 140°. The end that comes against the pedicle is slightly splayed out and has thick lips, while at the other end is a drum on which the cord of the tourniquet is wound.

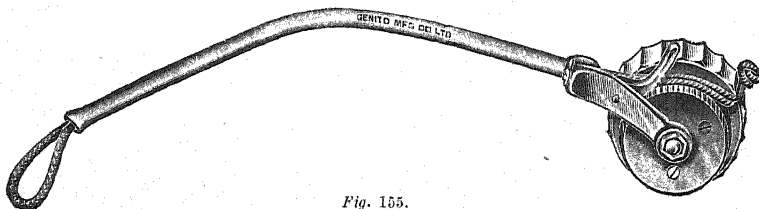


Fig. 155.

The tube is threaded, from the drum end, with a loop of thick blind cord, the loose ends of which are knotted together and are then attached to the drum by fitting into a groove on the rim. The drum will wind in either direction, but when the ratchet-catch is applied the cord can only be wound up. In practice the catch is not used until most of the loop has been wound in; it is then applied and the cord steadily tightened up round the pedicle. (The Genito-Urinary Mfg. Co. Ltd., 28a, Devonshire Street, London, W.1.)

Local Anæsthetic Apparatus.—Mr. Hamilton Bailey, F.R.C.S., has devised a local anæsthetic apparatus (*Fig. 156*) which for infiltrating large areas with local anæsthetic has many advantages. The apparatus is sterilized by boiling. It is filled with 1 per cent novocain, and the pump is operated until the desired pressure is registered on the gauge. By turning the tap near the needle a continuous stream of local anæsthetic is available.

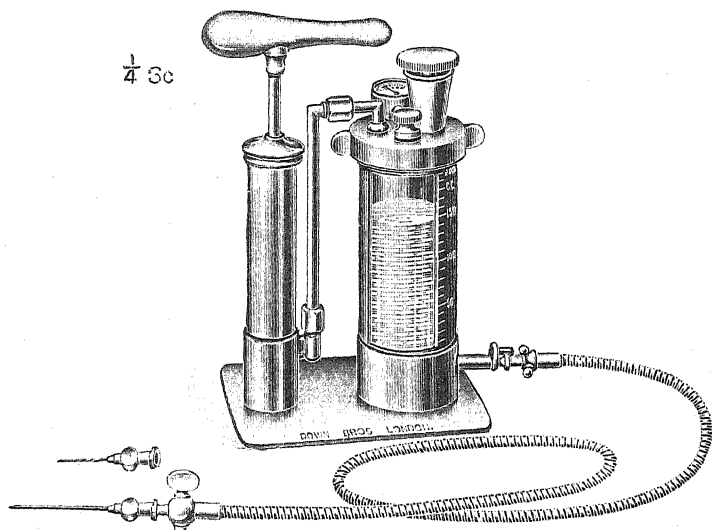


Fig. 156.

By employing this apparatus considerable areas can be infiltrated in a few moments with far less fatigue than when a syringe is employed. However, the ordinary syringe is still used for blocking deep nerves when veins are likely to be in the vicinity.

This apparatus has been in use for six months and has been found most satisfactory. The makers are Down Bros. Ltd., London, S.E.1.

Mandibular Nerve Needle.—The illustration (*Fig. 157*) shows a needle designed

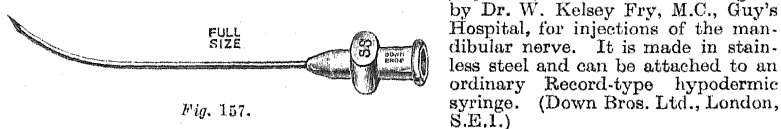


Fig. 157.

Mask (Improved Schimmelbusch).—This improvement, devised by Dr. Karslake Eccles, of Hove, consists of the fitting of a wire clip (*Fig. 158*), similar to that on a milk bottle. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Mastoid Operation Instruments.—After completion of the radical mastoid operation a portion of the temporal muscle is transplanted into the mastoid cavity. The flap is also used to fill a post-operative mastoid fistula. The posterior part of the temporal muscle is

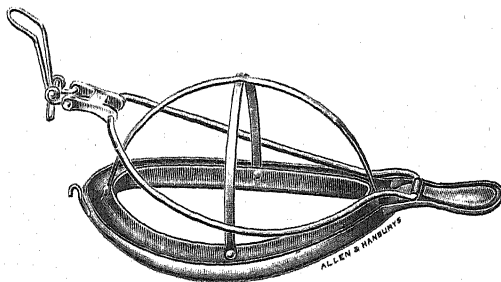


Fig. 158.

mobilized from the overlying integument and from the underlying periosteum. A demilune of muscle is excised, leaving a pedicle attachment anteriorly. The flap is turned down into the cavity.

To simplify this operation Mr. N. Asherson, F.R.C.S., has designed a set of instruments (*Figs. 159, 160*) consisting of the necessary retractors, a rugine, and knives of various shapes and angles for the mastoid incision and for cutting the muscle flap. (Mayer & Phelps, 'Chiron House,' New Cavendish Street, London, W.1.)

Myringotome.—Royce's improved myringotome is an adjustable instrument which can be fixed either for the straight or angular lines. When not in use the knife can be folded up between the handle. (Donald M. Gaw, Chapel Walks, Liverpool.)

Nasal Speculum.—A new type of nasal speculum having three blades (*Fig. 161*), which is much more comfortable and effective in use than the old types. It has a spring

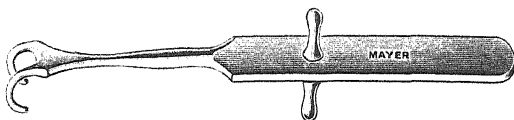


Fig. 159.

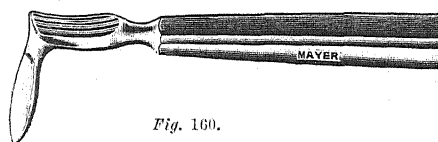


Fig. 160.

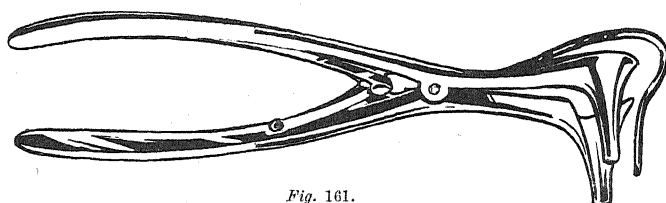


Fig. 161.

action, held between the handles. Price: carbon steel, chrome plated, 12s. 6d. each. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

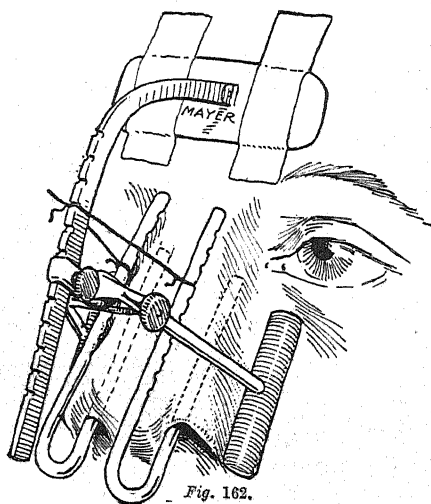


Fig. 162.

Nasal Splint.—This splint (*Fig. 162*), designed by Mr. A. B. K. Watkins, M.S., F.R.C.S., Ear, Nose and Throat Surgeon to the Newcastle and Wallsend Hospitals, New South Wales, is intended for use in the more extreme fractures of the nasal bones, accompanied by falling-in of the bridge.

One limb of a metal U-shaped splint is inserted into each nostril, and anterior traction is applied by a silk thread tied to a notch on the outside limb opposite the middle of the nasal bone. This produces the same effect as Carter's splint, only without perforating the nose with threads.

The rest of the splint consists of a hinged arch with rubber-covered bases, which rest on the cheeks. A mast from a hinged forehead plate which is held in place with strapping, can be adjusted to the apex of the arch with a screw.

The silk threads from each of the

U-shaped splints are tied to one another over one of the notches of the mast, the notch being selected which will allow traction to be exactly at right angles to the nasal bones. After these threads have been tied, tension can be adjusted by a screw, which alters the angle between the limbs of the arch.

Nasal respiration is possible with this splint. (Mayer & Phelps, 'Chiron House,' New Cavendish Street, London, W.1.)

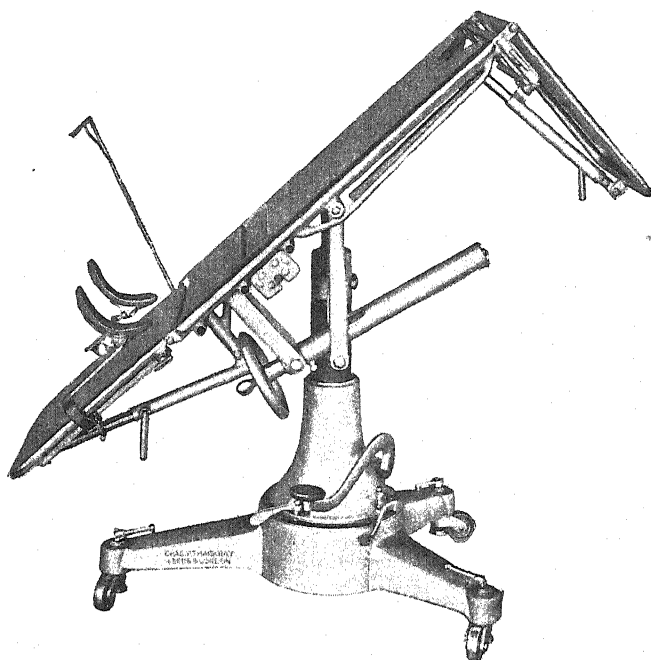
Needles, Hypodermic.—Hypodermic and Serum 'Leak Proof' Needles (*Fig. 163*) provide a liquid- and air-tight fitting at the junction of needle mount and syringe nozzle and eliminate rock or play. The mounts are specially bored and tapered to enable quick threading of stilettes. Each mount is numbered with needle size and has concave finger grips. English manufacture throughout, and each needle guaranteed by individual inspection. A price list can be obtained from Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.



Fig. 163.

Operation Tables.—The 'Thackray' Operation Tables (*Fig. 164*) fulfil all the requirements of modern surgery.

Of robust construction, fool proof, easily worked, and rigid in all positions. The 'Cairo' model with stainless steel top and chrome-plated fittings gives a complete operation table, and no further extras are required. Of British manufacture throughout



[Fig. 164.]

from selected materials. Descriptive booklet, 'Modern Operation Tables,' sent on application. (*See Advert., p. xvi.*) (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Ophthalmic Diatherm.—This new apparatus has been introduced by the Royal London Ophthalmic Hospital for treatment of detachment of the retina by endothermic cauterization. The results achieved are an advance on any method previously

attempted. The apparatus has also proved highly successful for treatment of hypopyon ulcers and electrolysis. It is unique in that it represents the advent of the use of diathermy current in ophthalmic surgery.

The apparatus is manufactured by John Weiss & Son Ltd., 287, Oxford Street, London, W.1.

Percussor.—This is a most useful percussion instrument (*Fig. 165*) which can be readily carried in the pocket. It has a cone-shaped metal head with a whalebone stem.

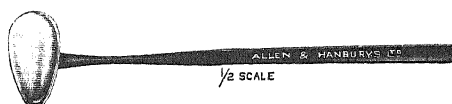


Fig. 165.

It was designed by Dr. Watson Smith, of Bournemouth. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

We have received a similar percussor, with ebonite handle, from Reynolds & Branson Ltd., 13, Briggate, Leeds, which is only 5 in. long and is also a convenient type to carry in the bag or pocket. Its price is 3s.

Peritonsillar Lancet.—To introduce a knife into the palate at the correct site is not an easy matter when the tissues are swollen to such an extent that the patient can barely open his mouth. To meet such cases Dr. L. J. Curtin (Dublin) has devised the peritonsillar lancet (*Fig. 166*). The advantages claimed are:—

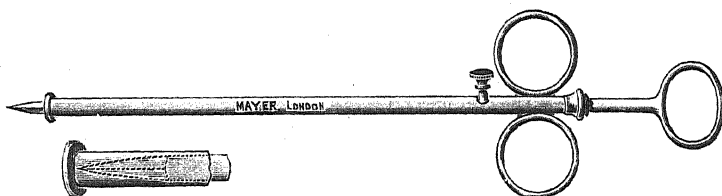


Fig. 166.

(1) The rings for thumb and fingers give a steady hold of the instrument without obstructing the vision; (2) The cutting blade is protected until the actual incision is made, then the blade is withdrawn into its sheath; (3) The double-edged blade penetrates the tissues easily, and with little discomfort to the patient; (4) In a nervous patient the procedure is rendered safer and less difficult than when an ordinary scalpel is used; and (5) The blade can be taken out of the sheath for sterilization. (Mayer & Phelps, 'Chiron House,' New Cavendish Street, London, W.1.)

Another very useful instrument for opening peritonsillar abscesses is illustrated here (*Fig. 167*). The pointed double-edged knife-blade is obscured, and lies in the shaft, being held back by a spring. It is operated by pressure on the thumb ring at the end.

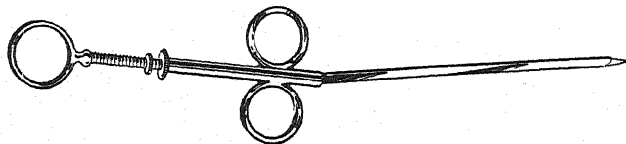


Fig. 167.

The length of the point to be used can be regulated by the milled nut operating on the thread of rod. Price: carbon steel, chrome plated, 10s. 6d. each. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

Proctoscope.—The Klinostik Electric Proctoscope (*Fig. 168*) is a further improvement on the electric rectal speculum. The new 1934 model is fitted with a large capacity battery handle with adjustable rheostat to control the intensity of the light, and provides a maximum illumination of the rectum.

When the proctoscope is inserted and the obturator withdrawn, a patent protector lamp cover prevents faeces from soiling the illuminant, and it is only after the lumen of the speculum has been swabbed out that the cover is removed and the lamp pushed up to the forward position. The instrument is fitted with a sliding top blade and, when this is withdrawn, the wall of the anal canal and rectum can be seen for the whole length of the speculum. The lamp is detachable so that the instrument may be sterilized. It can be had in nickel at 39s. and chromium at 44s. A special model has been made to take Canadian and American cells. The makers are John Smith & Son (Glas.) Ltd., 26-30, Gibson Street, Hillhead, Glasgow, and it can be purchased from any surgical house in Great Britain or the Dominions.

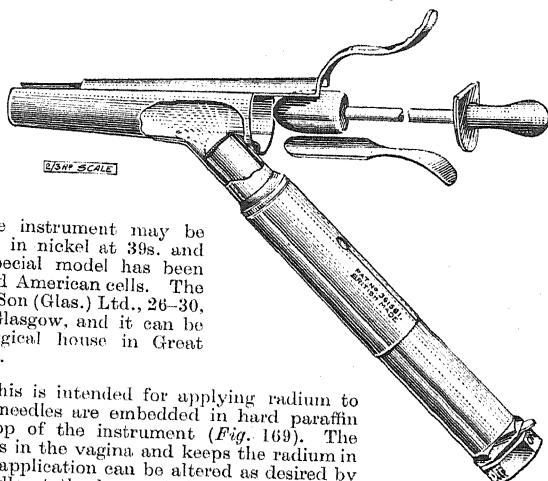


Fig. 168.

Radium Applicator.—This is intended for applying radium to the cervix. The radium needles are embedded in hard paraffin wax in the hole at the top of the instrument (*Fig. 169*). The body of the instrument lies in the vagina and keeps the radium in apposition. The point of application can be altered as desired by turning the T-shaped handle at the base. This was designed by Prof. Tottenham, of Hong Kong University. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Radium Pessary.—The object of the Mount Vernon Hospital Butterfly Radium Pessary is to adjust the radium in the vagina so that it will radiate the bases of the broad ligaments. The difficulty of keeping loose boxes in proper position by gauze packing is a very real one and can be demonstrated by taking X-ray photographs a few hours after the radium is inserted.

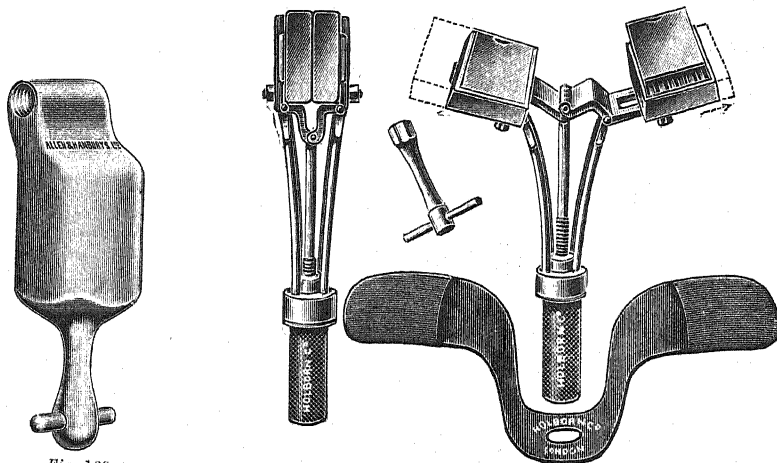


Fig. 169.

Fig. 170.

This butterfly pessary (*Fig. 170*) has a small nut with which the width of the pessary can be regulated to suit a small or large vaginal vault. It is covered with rubber and inserted in the closed position and then two or three turns of the handle suffice to spread out the two wings. Gauze is then packed in the vagina to keep the rectum as far away as possible and to prevent any descent of the pessary as a whole.

This improved model is made so that the boxes containing the radium may be closed flat, which is a distinct advantage when inserting the pessary. The boxes are made of silver and the rest of the instrument of stainless steel. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E.C.1.)

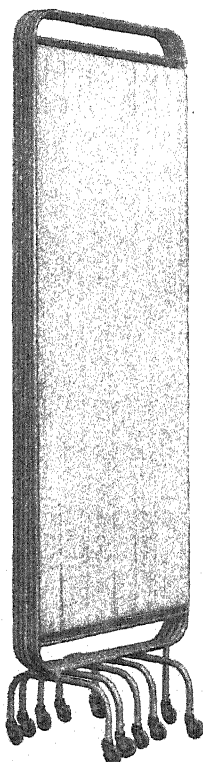


Fig. 171.

Screens.—The 'Thackray' Improved Hospital Screen (*Fig. 171*) (Pat. No. 394, 733) gives complete screening of the bed. It is strongly made from seamless drawn steel tube with all joints welded and provides a perfectly smooth surface easily kept clean. The interrupted arms which are welded to top and bottom of each fold provide an ideal method of carrying the curtains. The sagging of heavy curtains is prevented and there is no gap between the folds. Light in weight, it can be easily moved or carried with one hand. Each fold is mounted on two 2-in. rubber-tyred ball-bearing castors for mobility. An illustrated leaflet will be sent on request. (Chas. F. Thackray, Park Street, Leeds, and 262, Regent Street, London, W.1.)

Smith-Petersen Pin.—Mr. R. Broomhead, F.R.C.S., writes: When I showed some patients who had been treated by the insertion of a Smith-Petersen pin for a high fracture of the neck of the femur at the Royal Society of Medicine on April 4, 1933, I described a modification of the original pin and also an extractor for removing it, either at the time of the operation if the aim is not correct, or later if it is thought desirable, when bony union has occurred.

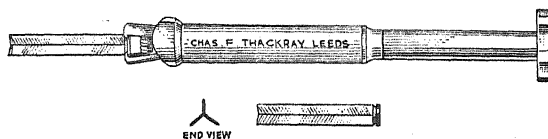


Fig. 172.

The original pin had a round head, difficult to grasp. I therefore had a V-shaped groove cut so that the head could be more easily held by a clamp. The accompanying diagram (*Fig. 172*) shows how the shape of the head has been improved.

The extractor is made with a clamp to grasp the head of the pin. The clamp has two limbs, with a spring between to separate them when they are released from the body of the extractor. The limbs are fixed to a threaded shaft, which can be screwed up and down inside a cylinder so that the pin may be withdrawn into the cylinder. Counter-traction is obtained by pressure of the distal end of the instrument against the lateral surface of the great trochanter of the femur, and it is necessary to make the instrument fit closely to the bone. The distal end of the extractor is thickened to make a broad area for counter-traction, and is curved to accommodate the circumference of the femur; and, as the neck of the femur is at an angle of 125° with the shaft, the lower margin of the butt of the instrument is cut away, while the upper margin is prolonged, to enable the instrument to fit snugly against the shaft of the bone. The handle is made so that it can be grasped easily and does not catch the operator's rubber glove.

I showed the instruments to Dr. Smith-Petersen when in Boston recently, and he is now using them himself. (Chas. F. Thackray, Park Street, Leeds, and 262, Regent Street, London, W.1.)

Sterilizer Recording Gauge.—The 'Thackray' Recorder (*Fig. 173*) has been designed to eliminate guesswork and to automatically record details of the conditions prevailing inside the sterilizer. It is of especial value where sterilization of surgical dressings and other materials is done by hospital porters in autoclaves which are not in the theatre unit.

An indelible record is automatically written on a circular chart printed in two colours, suitably marked for easy reading, and which is revolved by a clock making one complete revolution in twenty-four hours.

The chart is calibrated from 0 in. to 15 in. vacuum, and 0 lb. to 30 lb. per square inch steam pressure with equivalent temperature readings. It is radially marked with

30-minute time calibrations, the time being shown round the circumference. One chart records every sterilization process in twenty-four hours.

The gauge can be locked, so that it is at all times under the control of the theatre supervisor.

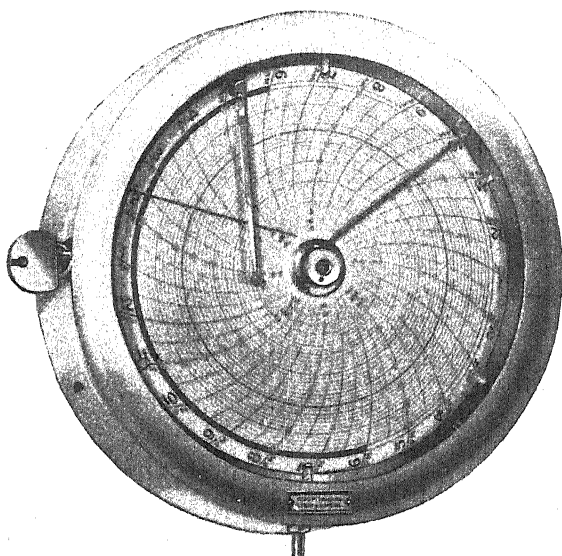


Fig. 173.

The instrument is of sturdy construction and handsome appearance, and will give years of accurate service. A descriptive circular will be sent on request. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Sterilizer for Syringes and Small Instruments.—This portable sterilizer (*Fig. 174*) is of stainless steel throughout. The boiler is stamped out of one piece and therefore

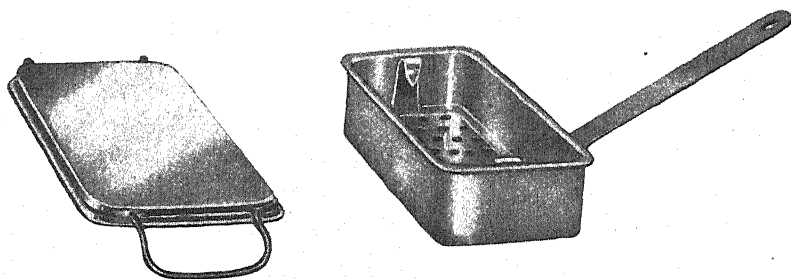


Fig. 174.

cannot leak, and the side handle is detachable. It is supplied with or without strainer. Sterilizer, size 8 in. \times 3 in. \times 1 $\frac{3}{4}$ in. with lid, side handle, and strainer, 30s. 9d., or without strainer 21s. 9d. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E.C.1.)

Sterilizers (Electric).—The new type of 'Standard' Electric Automatic Sterilizers (*Fig. 175*), with patent heat control and cut out, are an achievement of British manufacture. They are tested and guaranteed and suitable for alternating current or direct

current for all standard voltages. A descriptive list of various types and sizes will be sent on request. (*See Advert., p. xv.*) (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

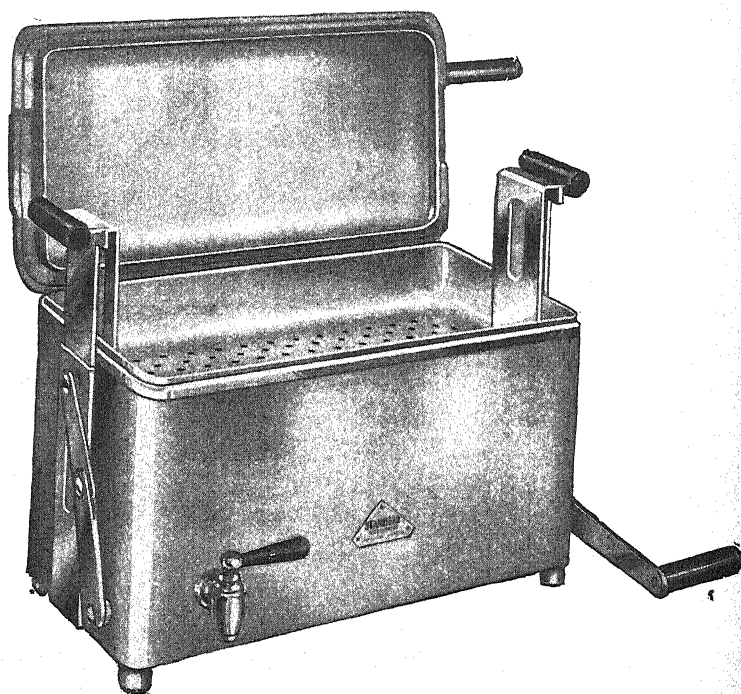


Fig. 175.

Stretcher Splint.—The 'Universal' Stretcher Splint (*Fig. 176*) has been designed for abduction, extension, and non-operative treatment of all cases of tuberculous disease of the hip or spine, and for any treatment requiring complete immobilization.

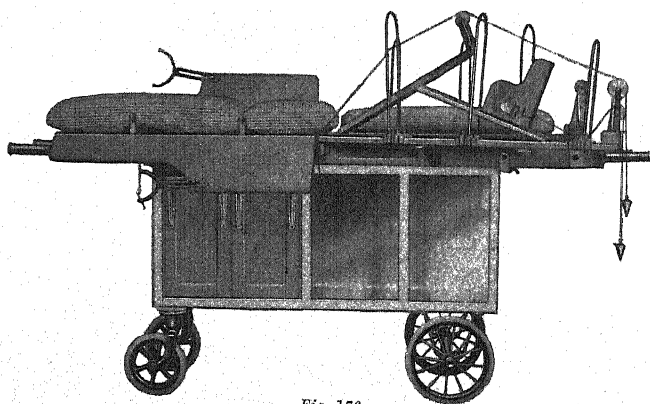


Fig. 176.

The splint embodies facilities for the application of fundamental principles in local non-operative treatment of tuberculous disease in the hip, spine, or knee, and in any treatment which requires immobilization, abduction, and traction or extension.

In arranging for these various methods of treatment, provision must also be made for general treatment such as heliotherapy, hygiene, radiology, etc., and for easy and rapid access to patient for the dressing of wounds, sponging, treatment of sinuses, massage, bed-pan service, etc., without disturbing the patient's position essential to the local treatment.

Although there are many well-known splints on the market which have done good service in the past, none so far has been evolved equally suitable for child and adult patients; and particularly in the case of the latter, it has hitherto been left to the ingenuity of the superintendent or surgeon in charge to improvise mechanical means for the practice of the above principles and to suit individual cases.

The 'Universal Splint' is the result of combined medical and engineering experience in an effort to embody in one splint facilities for a wide range of treatment, thereby providing one apparatus of wide application and general utility. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Suction Apparatus.—An efficient *silent* suction apparatus is essential in many throat investigations and operations and for many operations on other parts of the body.

Guy's Suction and Air Delivery Unit (*Fig. 177*), designed by Mr. Wm. Mayhew Mollison, C.B.E., F.R.C.S., can rightly claim to be more efficient than the apparatus generally in use. The suction is continuous and so powerful that clots of blood and the most tenacious mucus are quickly removed. The apparatus is quiet and can easily be moved about the operation theatre and from one theatre to another. It is possible to use it for intratracheal insufflation at the same time as suction, since the pump delivers sixty litres of air per minute. The valves in the cylinder head are strong and specially designed for silence in operation, and the sump of the machine carries enough oil for six months' continuous use.

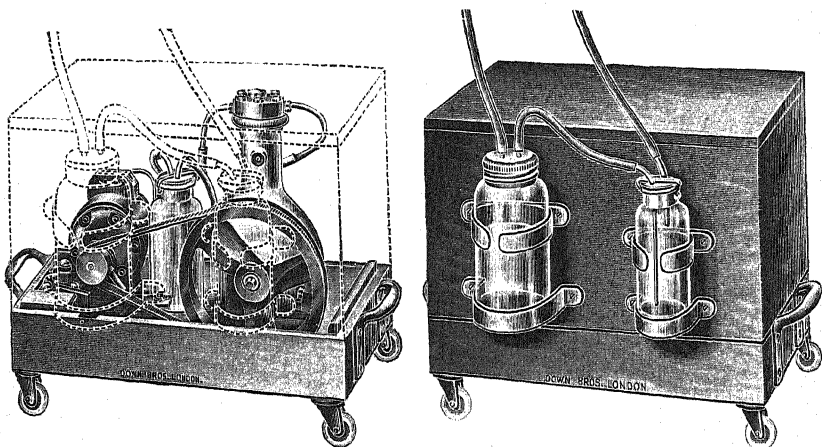


Fig. 177.

The entire unit is mounted in a strong mahogany case fitted with four rubber-tired castors. On the side of the case two large screw-necked bottles are mounted. These bottles are of the commercial 'Kilner' type and can therefore be replaced with the minimum of expense. Blood and other fluids are removed from the operating field by the suction plant and find their way into the big bottle. The second bottle is a safety trap in the unlikely event of the first bottle becoming full at a moment when it is inconvenient to change it.

There are no resistances to regulate the speed, and in order to use the apparatus it is only necessary to connect it to the main electrical supply. The makers are Down Bros. Ltd., London, S.E.1.

Suction Pumps.—The Chiron Portable Suction Pump (*Fig. 178*) is designed to clear the operation field of blood and secretions, one slight pressure of the foot being usually sufficient. Under normal conditions a vacuum of 20 to 25 in. is easily obtainable. It

is noiseless in action and being non-electrical removes the danger of explosion through sparking. The advantage of a bloodless field in operative work needs no stressing.

This apparatus is especially useful in oral and intra-nasal operations, and anaesthetists will appreciate the ease with which the pharynx may be cleared of blood and vomit, supplying almost a dry field, obviating the necessity of constant swabbing.

For peroral endoscopic work it is of the greatest value, enabling the operator to carry out a full examination and spot the foreign body or growth much more rapidly and accurately than when employing swabs. Soft foreign bodies, such as peas or pieces of meat, can be removed from the bronchi by suction.

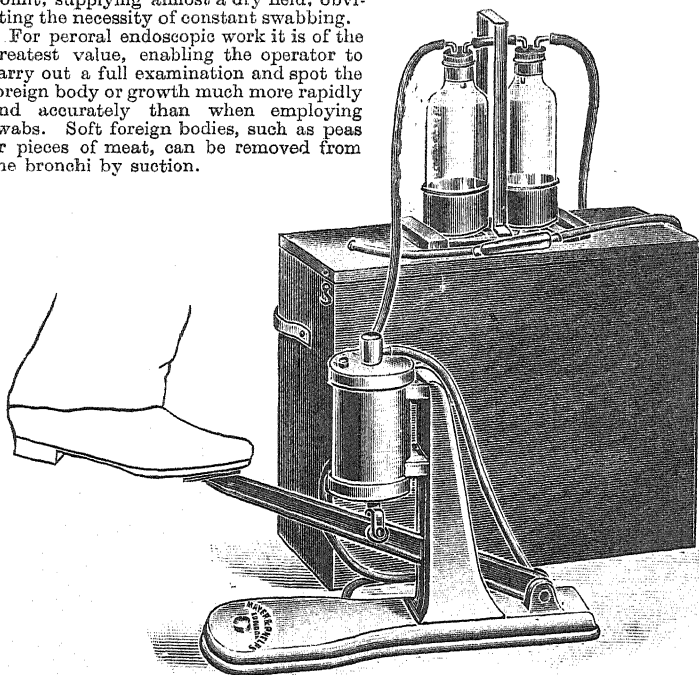


Fig. 178.

Fluids can also be rapidly removed in abdominal, pelvic, and bladder surgery. (Mayer & Phelps, 'Chiron House,' New Cavendish Street, London, W.1.)

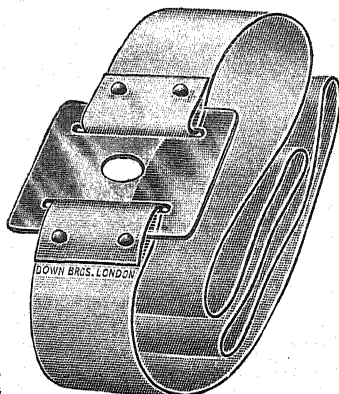
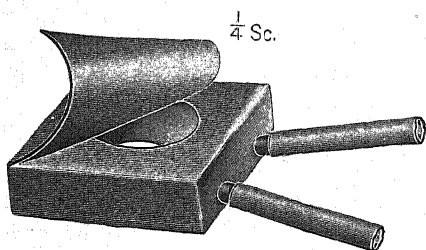


Fig. 179.

Suprapubic Drainage Apparatus.—Mr. Terrence J. Milin, F.R.C.S., has designed a suprapubic drainage apparatus (Fig. 179), with rubber box, celluloid plate, and band complete. With this apparatus a soft sponge rubber pad with a sheet rubber exterior has replaced the usual rigid box

that so frequently proves difficult to maintain in apposition without undue pressure. It is comfortable for the patient and gives with the body movement.

The covered sponge-rubber suprapubic box, as modified, with flap top and celluloid lid has proved entirely satisfactory, and patients who have experienced both the usual Hamilton-Irving box and the rubber variety are unanimous in their approval of the latter. (Down Bros. Ltd., London, S.E.1.)

Sutures.—*General Utility Sutures* are fitted with improved eyeless needles, thus reducing the thickness of the suture materially to a single strand which is approximately of the same diameter as the needle, thereby facilitating suturing, particularly in plastic surgery where the cosmetic result is of importance. They form a compact assortment of sterilized absorbable and non-absorbable sutures mounted on either curved triangular cutting, or straight cutting, eyeless needles of suitable size. Each eyeless needle suture is ready for immediate use, in a hermetically sealed glass tube.

The Suture Materials are: plain catgut, 24 in.; synthetic silkworm gut, 24 in.; medium hard catgut, 24 in.; silkworm gut, 14 in.

'A. & H.' General Utility Sutures are available in boxes containing 6 tubes of one material, or assorted as desired. Price per box, 5s. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Ribbon Gut is an absorbable ribbon of animal tissue developed by Davis & Geck for the closure of nephrotomy wounds by the Lowsley Bishop-Didusch technique. The success experienced and the nature of the material itself suggests that it will have a wide field of usefulness in other branches of surgery. Because of its width, ribbon gut distributes pressure over a broad surface, permitting the application of tension to delicate tissues without cutting through and with a minimum of circulatory constriction.

Like all Davis & Geck sutures, it is sterilized by heat at temperatures in excess of the most rigid bacteriological requirements. It is tubed in a stable, high-boiling solution, is unaffected by age, climate, or light, and the exterior of the tubes may be sterilized either by boiling, autoclaving, or immersion in an active germicidal solution.

Ribbon gut is at present available in the plain (non-chromicized) variety, $\frac{3}{8}$ in. in width, 18 in. in length, at 12s. per dozen tubes, subject to quantity discounts. A descriptive circular of other sutures will be sent on application to the distributor, Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.

Tonsil Sutures are another new product of Davis & Geck, and consist of size 0 plain catgut with half-circle needle affixed and designed to minimize trauma. These can be obtained in the boilable and non-boilable varieties from the same distributor.

Tannic Acid Outfit for Burns.—This outfit consists of an amber bottle fitted with a vulcanite spray and best rubber bellows, together with a supply of tannic acid compound tablets, complete in cardboard box (Fig. 180). The tablets, which also contain a small proportion of perchloride of mercury and boric acid, are of such strength that one tablet dissolved in 2 oz. of warm water forms a 2 per cent solution of tannic acid. This forms an admirable first-aid dressing, easily applied by means of the spray or on linen or layers of sterile gauze thoroughly soaked in the solution. (C.J. Hewlett & Son Ltd., 35-42, Charlotte Street, London, E.C.2.)

Thumb Splint.—The annexed illustration (Fig. 181) shows a splint designed by Sir W. I. de C. Wheeler, F.R.C.S.I., for Bennett's fracture of the thumb.

In the absence of efficient treatment poor functional results often follow an oblique fracture through the base of the first metacarpal bone. In a typical case extension is, as a rule, required for about three weeks. It is difficult to obtain the uninterrupted extension and fixation required by the splint recommended by Bennett, or with any of those in common use.

The splint illustrated has proved effective, and is easily extemporized from one of the common Jones's grooved aluminium arm splints. It is applied to the radial aspect of the forearm. At its distal extremity there is an aperture through which the thumb passes. An extension copper wire (10 S. W. G.) gallows is riveted to the aperture, and projects in an abducted direction beyond the tip of the thumb. Extension is maintained by tapes attached to adhesive plaster strips on the thumb and tied tightly to the end of the gallows. Throughout the treatment the tapes must be kept tight. A small felt or sponge pad is put under the splint at the site



Fig. 180.

puncture. The cannula of the trocar contains an automatic spring stopcock. On withdrawing the stainless steel trocar, the automatic spring stopcock closes the cannula and deflects the stream of urine through the side branch. The makers are Down Bros. Ltd., London, S.E.1.

Trolley.—This is a convenient form of trolley (*Fig. 186*) for holding the debris bowl or basin in an operating theatre. It is claimed that it possesses advantages over the basin in general use inasmuch as that pattern usually has the wheels fixed to the bottom of the receptacle and therefore the receptacle itself cannot be put in a sterilizer.

Messrs. Down Bros. Ltd., London, S.E.1, supply these trolleys in various sizes for holding the usual range of bowls, buckets, basins, etc.

Ultra Syringe.—The 'Ultra' Syringe (*Fig. 187*) is an ideal syringe of considerable and practicable value, and is a decided improvement on the old Record type.

It is suitable for all kinds of injections—hypodermic, intravenous, and intramuscular—and the provision of finger grips allows it to be employed as a pressure syringe if so desired. The finger grips also give greater and better control during manipulation.

The syringe is composed of two parts only: the barrel, made of special glass, and metal piston. On the collar, which is fixed to the glass barrel, is a simple device allowing at will a complete with-

drawal of the piston for sterilization process, or, when it is locked into position, preventing the piston from leaving the barrel (*see Advt., p. xii*). (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

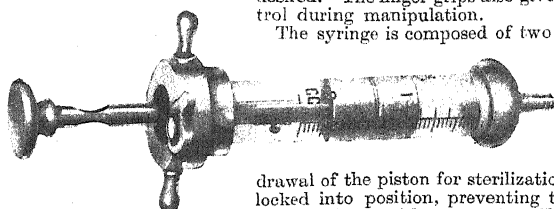


Fig. 187.

Uterine Compressor.—This instrument was designed by Mr. Victor Bonney, M.S., for preventing hæmorrhage during incision into the uterine wall for Cæsarean section. It is illustrated in *Fig. 188*. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)



Fig. 188.

Vaginal Speculum.

The Morna Rawlins speculum here illustrated (*Fig. 189*) is similar to the Ferguson type, with the addition of a thickened rim well rounded off at the distal end. This avoids possible damage to the mucous membrane and tends to make the speculum self-retaining. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E.C.1.)



Fig. 189.

Vaginal Speculum.—The Klinostik Electric Vaginal Speculum (*Fig. 190*) is designed by a well-known gynaecologist and is in general pattern similar to Sim's duckbill speculum. It has many points to recommend it, and it is suitable for the gynaecologist, the general practitioner, and for V.D. work. It is easy to manipulate and gives excellent illumination of the cervix and the anterior and posterior

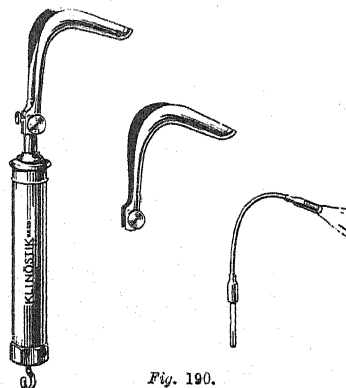


Fig. 190.

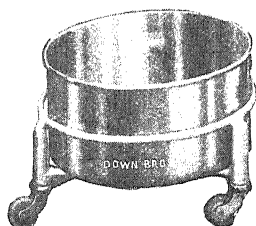


Fig. 186.

walls of the vagina. A pleasing feature is that every part of the instrument can be sterilized.

The speculum, of which interchangeable varying sizes are available, and the lamp carrier are detachable. The provision of a terminal hook allows of the attachment of a weight, the purpose of which is to render the instrument self retaining. The price with one speculum is 39s. A special model has been made for the Canadian and American markets to take the standard Canadian and American cells, and the speculum is obtainable from all instrument dealers in Great Britain and the Dominions. The instruments are made by John Smith & Son (Glas.) Ltd., 26-28, Gibson Street, Hillhead, Glasgow.

Vaginascope.—The Klinostik Bi-Valve Electric Vaginascope (*Fig. 191*) is a great improvement on the ordinary speculum and gives maximum illumination of the vagina. It is easily inserted, and the fenestrated blades and large capacity handle with adjustable rheostat, to control the intensity of the light, are features which will be readily appreciated.

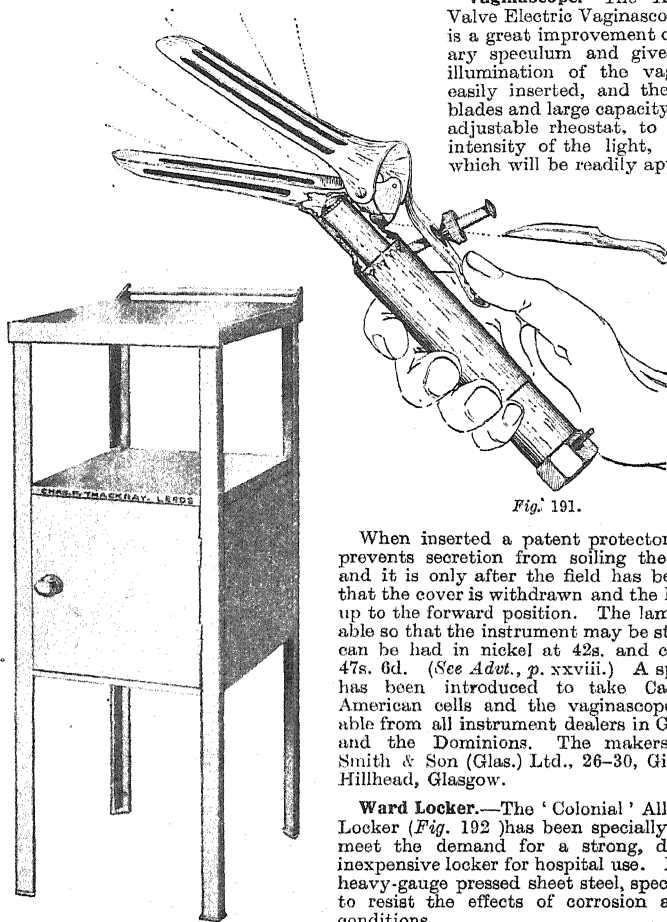


Fig. 191.

When inserted a patent protector lamp cover prevents secretion from soiling the illuminant, and it is only after the field has been cleansed that the cover is withdrawn and the lamp pushed up to the forward position. The lamp is detachable so that the instrument may be sterilized. It can be had in nickel at 42s. and chromium at 47s. 6d. (*See Advt., p. xxviii.*) A special model has been introduced to take Canadian and American cells and the vaginascope is obtainable from all instrument dealers in Great Britain and the Dominions. The makers are John Smith & Son (Glas.) Ltd., 26-30, Gibson Street, Hillhead, Glasgow.

Ward Locker.—The 'Colonial' All Steel Ward Locker (*Fig. 192*) has been specially designed to meet the demand for a strong, durable, and inexpensive locker for hospital use. It is made of heavy-gauge pressed sheet steel, specially treated to resist the effects of corrosion and climatic conditions.

The finish is cellulose enamel with stoved-on undercoat, and can be supplied in white, silver grey, or pastel green. Can easily be kept clean with a damp cloth (*see Advt., p. xiv.*) (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Fig. 192.

BOOKS OF THE YEAR.

A LIST OF THE PRINCIPAL ENGLISH MEDICAL WORKS AND NEW EDITIONS
PUBLISHED DURING THE TWELVE MONTHS ENDING DECEMBER, 1933.

* For the convenience of our readers any of the works in this list can be obtained through
Messrs. John Wright & Sons Ltd., Publishers of the 'Medical Annual'
Stonebridge House, Bristol.

AMBULANCE AND NURSING.

- BRITISH RED CROSS SOCIETY NURSING MANUAL, No. 2. By H. C. Parsons. 4th ed. 18mo, pp. 308. 96 Illus. *Cassell* - Net 1s. 6d.
- GYNÆCOLOGY EXPLAINED TO NURSES. By Dorothy M. Dickinson. 8vo, pp. 208. *Faber* - Net 9s. 6d.
- HOW TO BECOME A NURSE. 12th ed. Cr. 8vo, pp. 440. *Faber* - Net 4s.
- HYGIENE FOR NURSES. By J. Guy and G. J. I. Linklater. 2nd ed. Cr. 8vo, pp. 224. 22 Illus. *Livingstone* - Net 5s.
- MODEL ANSWERS TO QUESTIONS FOR MENTAL NURSES (PRELIMINARY AND FINAL EXAMINATIONS) SET BY THE GENERAL NURSING COUNCIL. By H. MacPhail. 2nd ed. Cr. 8vo, pp. 384. *Faber* - Net 5s.
- NEW DICTIONARY FOR NURSES. By Lois Oakes, assisted by T. B. Davie. 2nd ed. Demy 16mo, pp. 370. 81 Illus. *Livingstone* - Net 3s.
- NURSE'S DICTIONARY, THE. 13th ed., revised by Winifred M. Gray. 32mo, pp. 264. *Faber* - Net 3s.
- NURSING AS A CAREER. By C. L. Moles. Cr. 8vo, pp. 98. *Pitman* - Net 3s. 6d.
- OUTLINE OF MEDICINE FOR NURSES. By J. Fanning. Fcap 8vo, pp. 136. *Wright, Bristol* - Net 2s. 6d.
- OUTLINE OF PRACTICAL OBSTETRICS FOR NURSES. By R. S. S. Statham. Fcap 8vo, pp. 130. *Wright, Bristol* - Net 2s. 6d.
- OUTLINE OF SURGERY FOR NURSES. By D. W. Daniels. Fcap 8vo, pp. 88. *Wright, Bristol* - Net 2s. 6d.
- PRACTICAL NURSING, INCLUDING HYGIENE AND DIETETICS. By W. T. G. Pugh. 8th ed. 8vo, pp. 748. Illus. *Blackwood* - Net 12s. 6d.
- PUBLIC HEALTH NURSING IN INDUSTRY. By V. H. Hodgson. Cr. 8vo, pp. 271. Illus. *Macmillan* - Net 7s. 6d.
- PYE'S ELEMENTARY BANDAGING AND SURGICAL DRESSING. For the Use of Dressers and Nurses. Revised by A. J. Cokkinis. 15th ed. Pocket size, pp. 250. 87 Illus. *Wright, Bristol* - Net 3s. 6d.
- QUICK REFERENCE BOOK FOR NURSES. By Helen Young. *Lippincott* - Net 9s.
- SHORT ENCYCLOPÆDIA FOR NURSES. By Evelyn C. Pearce. 8vo, pp. 631. *Faber* - Net 12s. 6d.
- SHORT PRACTICE OF MIDWIFERY FOR NURSES. By H. Jellett. 9th ed. Cr. 8vo, pp. 520. 7 Plates and 183 Illus. *Churchill* - Net 8s. 6d.
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Fareham (Hants).—*Knowle Mental Hospital*. Res. Med. Supt., Dr. J. L. Jackson. Knowle, $\frac{1}{2}$ mile; Fareham, $3\frac{1}{2}$ miles.

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Glasgow District Mental Hospital, Gartloch, Gartcosh. Res. Med. Supt., Dr. A. M. Dryden. Garnkirk station, 1 mile.

Glasgow Royal Mental Hospital, Gartnavel. Res. Med. Supt., Dr. Angus MacNiven.

Hawkhead Mental Hospital, Glasgow, S.W.2. Res. Med. Supt., Dr. J. H. Macdonald. Crookston station.

Kirklands Mental Hospital, Bothwell, Glasgow. Res. Med. Supt., Wm. M. Buchanan, M.B. Bothwell and Fallside stations, $\frac{1}{2}$ mile; Glasgow, 9 miles.

Lanark District Asylum, Hartwood, Lanarkshire. Res. Med. Supt., Dr. N. T. Kerr. Hartwood, L.M.S. station, $\frac{1}{2}$ mile.

Smithston Asylum, Greenock. Res. Med. Supt., Wm. Leggett, M.D. Greenock West, $1\frac{1}{2}$ miles; Ravenscraig, $\frac{1}{2}$ mile.

Gloucester.—**Barnwood House Hospital for Nervous and Mental Disorders**. Res. Med. Supt., Arthur A. D. Townsend, M.D. Gloucester, 2 miles. *See also Advt., p. 119*

Gloucester County Mental Hospitals, Wotton and Coney Hill, Gloucester. Res. Med. Supt., Dr. F. C. Logan. Gloucester station, 1 mile.

Guernsey.—**St. Peter Port Asylum**. Med. Off., C. d'A. Collings, M.D.

Haddington, N.B.—**East Lothian District Asylum**. Supt., Miss Jean Sinclair. Med. Off., H. H. Roberts, M.D. Haddington station, 10 minutes.

Hatton (near Warwick).—**County Mental Hospital**. Res. Med. Supt., A. T. W. Forrester, M.D. Also *Leigh House*, for lady private patients. Warwick, G.W.R. station, 3 miles. *See also Advt., p. 121*

Hawick (Roxburgh, N.B.).—**St. Andrews**, Stitches. Vis. Phys., A. N. Bruce, M.D. Licensee, Sister Mary Agnes. Hawick station, 1 mile.

Haywards Heath.—**Brighton County Borough Mental Hospital**. Res. Med. Supt., G. H. Harper-Smith, M.A., M.D. Haywards Heath, $1\frac{1}{2}$ miles.

Beechmont, Lewes Road, Haywards Heath. For female private patients. Apply Med. Supt. *See also Advt., p. 120*

Hellingly.—**East Sussex County Mental Hospital**, near Eastbourne. Res. Med. Supt., F. R. P. Taylor, M.D. Hellingly station, 1 mile.

Henley-in-Arden (Warwickshire).—**Glen-dossill**. Res. Med. Supt., Dr. W. Agar. Henley-in-Arden, G.W.R., $\frac{1}{2}$ mile.

Hereford.—**Hereford County and City Mental Hospital**. Res. Med. Supt., Dr. G. W. H. T. Fleming. Barrs Court, G.W.R. and L.M. & S.R., Hereford, 3 miles.

Huddersfield (near).—**West Riding Mental Hospital**, "Storthes Hall," Kirkburton. Res. Med. Supt., C. W. Ewing, L.R.C.P. and S.I., D.P.M. Huddersfield, 5 miles.

Hull.—**City Mental Hospital**. Res. Med. Supt., Dr. J. S. Anderson. Willerby station, 1 mile; Hull, 6 miles.

Inverness.—**District Asylum**. Res. Med. Supt., William McWilliam, M.D., D.P.M. Inverness, $2\frac{1}{2}$ miles.

Ipswich.—**The Mental Hospital**. Res. Med. Supt., P. Banbury, D.P.M. Ipswich, 2 miles.

Isle of Man.—**Mental Hospital**, Union Mills, Douglas. Res. Med. Supt., Leslie H. Skene, M.C., M.B., Ch.B., Dipl. Psych. Ed. Union Mills, $\frac{1}{2}$ mile.

Isle of Wight.—**The County Mental Hospital**, Whitecroft. Res. Med. Supt., Dr. C. Davies-Jones. Blackwater, 1 mile; Newport, $2\frac{1}{2}$ miles.

Ivybridge.—**Plymouth Mental Hospital**. Res. Med. Supt., E. G. T. Poynder, M.R.C.S., L.R.C.P., D.P.M. Bittaford, $\frac{1}{2}$ mile; Wrangaton, G.W.R., $1\frac{1}{2}$ miles; Ivybridge, 3 miles.

Jersey.—**Jersey Mental Hospital**. Res. Med. Supt., C. Noble le Brocq, M.D. Gorey Village, 1 mile.

Kilkenny.—**District Mental Hospital**, Kilkenny. Res. Med. Supt., Dr. P. J. Cassin. Kilkenny station, $\frac{1}{2}$ mile.

Killarney.—**District Mental Hospital**. Res. Med. Supt., E. N. M. O'Sullivan, B.A., M.B., B.Ch., D.P.M. Killarney, $\frac{1}{2}$ mile.

Lancashire (near Newton-le-Willows).—**Haydock Lodge**. Res. Med. Licensee and Supt., J. C. Wootton, L.R.C.P., M.R.C.S. Newton-le-Willows, L.M. & S.R., 2 miles. *See also Advt., p. 113*

Lancaster.—**County Mental Hospital**. Res. Med. Supt., R. P. Sephton, B.A., M.R.C.S., L.R.C.P. Lancaster, L.M. & S.R. stations, each $1\frac{1}{2}$ miles.

Leek (Stafford).—**County Mental Hospital**, Cheddleton. Med. Supt., W. F. Menzies, M.D. Wall Grange station, 1 mile.

Leicester.—**City Mental Hospital**, Hum-burstone. Res. Med. Supt., J. F. Dixon, M.D. Leicester, L. & N.E.R. and L.M. & S.R., 2 miles.

Leicestershire and Rutland Mental Hospital, Narborough, near Leicester. Res. Med. Supt., K. K. Drury, M.C., M.D., D.P.M. Narborough, $\frac{1}{2}$ mile; Leicester, 6 miles.

Letterkenny.—**Donegal District Mental Hospital**. Res. Med. Supt., J. C. Martin, L.R.C.P. & S.I., L.M. Letterkenny and Lough Swilly Rly., or Strabane & Letterkenny Rly., 1 mile.

Lichfield.—**County Mental Hospital**, Burntwood, near Lichfield. Res. Med. Supt., W. Reid, M.A., M.B. Lichfield City, $3\frac{1}{2}$ miles; Hammerwich, $1\frac{1}{2}$ miles.

Limerick.—**District Mental Hospital**. Res. Med. Supt., Dr. P. J. Irwin. Limerick $\frac{1}{2}$ mile.

Lincoln.—**Bracebridge Mental Hospital**. Res. Med. Supt., Dr. John Macarthur, D.P.M. Lincoln, L. & N.E.R., $2\frac{1}{2}$ miles. *The Lawn Registered Hospital*, Lincoln. Res. Med. Supt., Dr. Myra Mackenzie. Lincoln station, 1 mile.

Liverpool.—*Shaftesbury House*, Formby, near Liverpool and Southport. Res. Phys., W. G. A. Erskine, M.D. (Edin.). Formby, $\frac{1}{2}$ mile. *See also Advt.*, p. 115

True Brook Villa, Liverpool, E. Res. Med. Supt., John Murray Moyes, M.B., Ch.B. True Brook station, $\frac{1}{2}$ mile, or Green Lane car. *See also Advt.*, p. 114

London.—*Bethlem Royal Hospital*, Monks Orchard, Eden Park, Beckenham, Kent. Phys. Supt., J. G. Porter Phillips, M.D., F.R.C.P. *See also Advt.*, p. 105

Brooke House, Clapton, E.5. Res. Med. Supts., Dr. Gerald Johnston and Dr. E. E. Rollins. Clapton, L. & N.E.R.

Camberwell House, 33, Peckham Road, S.E.5. Senior Phys., H. J. Norman, M.B., Ch.B., D.P.H. *See also Advt.*, p. 116

Chiswick House, Moss Lane, Pinner, Middlesex. Med. Supt., Douglas Macaulay, M.D. Pinner station, $\frac{1}{2}$ mile. *See also Advt.*, p. 106

Clarence Lodge, Clapham Park, S.W.4. Res. Licensee, Miss L. Thwaites. Med. Off., Dr. Percy Smith. Clapham Road (Southern Rly.) and Clapham Common (South London Tube), 15 minutes. Tel.: 4913 Tulse Hill. *See also Advt.*, p. 113

Fenstanton, Christchurch Road, Streatham Hill, S.W. Res. Med. Supt., J. H. Earls, M.D. Tulse Hill, 5 minutes; Streatham Hill, 10 minutes. Tel.: Tulse Hill, 7181. *See also Advt.*, p. 121

Flower House, Catford, S.E.6. Med. Supt., Wm. F. Umney, M.D. Res. Lic., Mrs. Walter & Beckett. Beckenham Hill, S.R. 5 minutes. *See also Advt.*, p. 119

Halliford House, Upper Halliford, Shepperton, S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Sunbury station, $\frac{1}{2}$ miles.

Hayes Park, Hayes, Middlesex. Res. Med. Off., Dr. H. F. Stilwell. Hayes, 2 miles.

Hendon Grove Private Mental Home (ladies only), Hendon, N.W.4. Res. Med. Off. and Licensee, Dr. H. R. S. Walford. Hendon Central (Hampstead Line), $\frac{1}{2}$ mile.

LONDON COUNTY COUNCIL Mental Hospitals (under the direction of the Mental Hospitals Dept., The County Hall, Westminster Bridge, S.E.1):—

Banstead, Sutton, Surrey. Res. Med. Supt., A. A. W. Petrie, M.D., F.R.C.S., F.R.C.P., D.P.M. Belmont station, S.R., $\frac{1}{2}$ mile; Sutton station, S.R., $\frac{1}{2}$ miles.

Bexley, Kent. Res. Med. Supt., G. Clarke, M.D. Bexley station, S.R., $\frac{1}{2}$ miles.

Cane Hill, Coulsdon, Surrey. Res. Med. Supt., G. A. Lilly, M.C., M.A., M.D., B.Ch., D.P.M. Coulsdon South or Coulsdon North, S.R., 10 minutes.

Claybury, Woodford Bridge, Essex. Res. Med. Supt., G. F. Barham, M.A., M.D., B.Ch. Woodford station, L. & N.E.R., $\frac{1}{2}$ miles.

Colney Hatch, N.11. Res. Med. Supt., J. Brander, M.D., M.R.C.P., D.P.M. New Southgate, L. & N.E.R.

Ewell, Epsom, Surrey. Res. Med. Supt., L. H. Wootton, M.C., B.Sc., M.B., B.S., D.P.M. Epsom, S.R., 2 miles; Ewell, S.R., 1 mile.

Hanwell, Southall, Middlesex. Res. Med. Supt., A. W. Daniel, B.A., M.D., B.Ch. Hanwell, G.W.R., 1 mile.

Horton, Epsom, Surrey. Res. Med. Supt., W. D. Nicol, M.B., B.S., M.R.C.P., D.P.M. Epsom, S.R., $\frac{1}{2}$ miles.

Long Grove, Epsom, Surrey. Res. Med. Supt., D. Ogilvy, B.A., M.D., B.Ch., B.A.O. Epsom, S.R., $\frac{1}{2}$ miles.

Tooting Bee Hospital, Tooting Bee Road, S.W.17. 2355 patients (both sexes). Res. Med. Supt., P. M. Turnbull, M.C., M.B., Ch.B., D.P.M. Balham, S.R., 3 minutes.

West Park, Epsom, Surrey. Res. Med. Supt., N. Roberts, O.B.E., M.D., B.S., D.P.M. Epsom, S.R., $\frac{1}{2}$ miles.

Maudsley Hospital (L.C.C.), Denmark Hill, S.E.5. For treatment of neurosis and curable mental disorder (voluntary patients only). Med. Supt., E. Mapother, M.D., F.R.C.S., F.R.C.P.

See also Advt., p. 65
Mead House, Hayes (for ladies). Med. Licensees, Dr. H. F. Stilwell and Dr. R. J. Stilwell.

Moorcroft House, Hillingdon, Uxbridge, 2 miles. Med. Licensees, Dr. R. J. Stilwell and Dr. G. W. B. James. West Drayton station, 2 miles.

Newlands House, Tooting Bee Common, S.W.17. Private Mental Hospital. Phys. Supt., Dr. Noel Sergeant. Balham station 1 mile; Trinity Road Station (Underground), $\frac{1}{2}$ mile. Motor bus Nos. 49, 4Ja, 49b, and 19a. *See also Advt.*, p. 119

Northumberland House, Green Lanes, N.4. Res. Med. Supt., Frederick Dillon, M.D. Manor House station, Piccadilly Underground, and Finsbury Park (G.N.) station. *See also Advt.*, p. 108

Otto House, 44, Sydenham Hill, S.E.26. Lic. Prop., Capt. F. H. Little. Lady Supt., Miss Brodie. West Kensington, 1 mile.

Peckham House, 112, Peckham Road, S.E.15. Props., A. H. & H. G. Stocker. Res. Med. Supt., Dr. F. R. King. Peckham Rye station, 10 minutes' walk.

See also Advt., p. 116
Springfield Mental Hospital, Tooting, S.W. 17. Med. Supt., R. Worth, O.B.E., M.B., B.S. Wandsworth Common station, 1 mile.

The Priory, Roehampton, S.W.15. Res. Med. Supt., Dr. B. W. Brown. Barnes station, 10 minutes.

West Ham Mental Hospital, Goodmayes, Essex. Res. Med. Supt., Dr. James Harvey Cuthbert. Goodmayes, 1 mile.

Wood End House, Hayes (ladies). Med. Lic., Dr. R. J. Stilwell and Dr. G. W. B. James. Hayes, 1 mile; Uxbridge, 3 miles.

Wyke House, Isleworth, Middlesex. Res. Phys., G. W. Smith, O.B.E., M.B., Ch.B. Edin. Syon Lane and Osterley stations.

See also *Advt.*, p. 116

Londonderry.—*District Asylum*. Res. Med. Supt., John Watson, M.C., M.B., B.Ch. Londonderry, 1 mile.

Macclesfield.—*Cheshire County Mental Hospital*, Parkside. Res. Med. Supt., H. Dove Cormac, M.B., M.S., D.P.M. Macclesfield, 1 mile. See also *Advt.*, p. 121

Maidstone.—*Kent County Mental Hospital*. Res. Med. Supt., A. C. Hancock, M.C., M.B., B.S., D.P.H., D.P.M. Maidstone West, $\frac{1}{2}$ miles.

Malling Place, West Malling, Kent. Res. Med. Supt., Dr. G. H. Adam. Malling station, 1 mile.

Market Lavington (Wilts).—*Fiddington House*. Med. Supt., J. R. Benson, F.R.C.S. Res. Licensee, The Rev. E. Benson. Lavington, G.W.R., 1 mile; Devizes, 6 miles.

Melrose, N.B.—*Roxburgh, Berwick, and Selkirk District Asylum*. Res. Med. Supt., Patrick Steele, M.D. Melrose, $\frac{3}{4}$ mile.

Melton (Suffolk).—*St. Audry's Hospital for Mental Diseases*. Res. Med. Supt., W. Brooks Keith, M.C., M.D. Melton station, $\frac{1}{2}$ miles; Woodbridge station, $\frac{2}{3}$ miles.

Menston (near Leeds).—*West Riding Mental Hospital*. Res. Med. Supt., S. Edgerley, M.D. Guiseley, L.M. & S., 1 mile.

Mersham (Surrey).—*County Mental Hospital*, Netherne, near Coulsdon. Med. Supt., Dr. P. C. Coombes. Coulsdon station, 2 miles.

Middlesbro' (Yorks).—*St. Luke's Hospital*. Res. Med. Supt., Dr. H. G. Drake-Brockman. Middlesbro', 2 miles.

Monaghan (Ireland).—*Monaghan Mental Hospital*. Res. Med. Supt., Dr. T. P. Conlon. Monaghan, $\frac{1}{2}$ mile.

Montrose, N.B.—*The Royal Asylum*. Res. Med. Supt., C. J. Shaw, M.D. Dubton, 1 mile; Montrose, 3 miles.

Morpeth.—*Northumberland Mental Hospital*. Res. Med. Supt., Guy R. East, M.D., D.P.H. Morpeth station, 1 mile.

Mullingar.—*District Mental Hospital*. Res. Med. Supt., Dr. Laurence Gavin. Mullingar station, 1 mile.

Newcastle-on-Tyne.—*City Mental Hospital*, Gosforth. Res. Med. Supt., H. D. MacPhail, M.D. Newcastle Central, L. & N.E.R., 3 miles.

Northampton.—*Berrywood Mental Hospital*. Res. Med. Supt., Dr. F. J. Stuart. L.M. & S. (L. & N.W.) station, $2\frac{1}{2}$ miles; L.M. & S.R. (Mid.), 3 miles.

St. Andrew's Hospital, Northampton. Med. Supt., D. F. Rambaut, M.A., M.D. Station, 1 mile. See also *Advt.*, p. 107

Norwich.—*Bethel Hospital for Mental and Nervous Disorders*. Res. Med. Supt., S. J. Fielding, M.B. Cons. Phys., Saml. J. Barton, M.D. Norwich (Thorpe) station, 1 mile. See also *Advt.*, p. 109

City of Norwich Mental Hospital, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Hellesdon, 1 mile.

Heigham Hall Private Mental Hospital, Norwich. Res. Med. Supt., Dr. J. A. Small. Norwich station, $\frac{1}{2}$ miles.

See also *Advt.*, p. 111

Norfolk County Mental Hospital, Thorpe, Norwich. Res. Med. Supt., O. G. Connell, M.C., L.R.C.P. & S. Whittingham, 1 mile; Norwich, $2\frac{1}{2}$ miles.

The Grove, Old Catton, near Norwich (for ladies). Vis. Phys., S. Barton, M.D. Apply to the Misses McLintock.

Nottingham.—*City Mental Hospital*, Mapperley Hill. Res. Med. Supt., G. L. Brunton, M.D. Nottingham, 2 miles.

Notts County Mental Hospital, Radcliffe-on-Trent, near Nottingham. Res. Med. Supt., H. C. Waldo, M.R.C.S., L.R.C.P. Radcliffe-on-Trent, 2 miles.

The Coppice, Nottingham. Res. Med. Supt., David Hunter, M.B. (Camb.). L.M. & S.R. station, $2\frac{1}{2}$ miles; L. & N.E.R. station, $\frac{1}{2}$ miles. See also *Advt.*, p. 110

Omagh (Co. Tyrone).—*Mental Hospital*. Res. Med. Supt., Dr. J. Patrick. Omagh, 2 miles.

Oxford.—*County and City Mental Hospital*, Littlemore. Res. Med. Supt., T. S. Good, O.B.E., M.A. (Oxon.), M.R.C.S., L.R.C.P. Littlemore station adjoining.

The Warneford, Oxford, $\frac{1}{2}$ miles. Res. Med. Supt., Alex. W. Neill, M.D. Oxford station, $2\frac{1}{2}$ miles. See also *Advt.*, p. 112

Paisley.—*Craw Road Asylum*. Res. Med. Off., Miss Enid Dixon, M.B., Ch.B. Paisley, 1 mile.

The Mental Hospital, Riccartonbar, Paisley. Med. Supt., Mary R. Knight, M.A., M.B., Ch.B. Paisley West, $\frac{1}{2}$ mile.

Renfrew District Asylum, Dykebar, Paisley. Res. Med. Supt., R. D. Hotchkis, M.D. Paisley, $2\frac{1}{2}$ miles.

Perth.—*District Asylum*, Murthly. Res. Med. Supt., Lewis C. Bruce, M.C., M.D. Murthly station adjoins the Asylum.

James Murray's Royal Mental Hospital, Perth (for patients of the middle and upper classes). Phys. Supt., W. D. Chambers, M.A., M.D., F.R.C.P.E. Perth station, under 2 miles.

Plympton.—*Plympton House*, Plympton, Devon. Res. Prop., Dr. J. C. Nixon. Plympton, 1 mile; Marsh Mills, 2 miles; Plymouth, 5 miles.

Portlaoighise (Queen's County).—*District Mental Hospital*. Res. Med. Supt., Dr. Pierce Grace. Portlaoighise, $\frac{1}{2}$ mile.

Portsmouth.—*City Mental Hospital*. Res. Med. Supt., Thomas Beaton, O.B.E., M.D., B.S. (Lond.), F.R.C.P. Clerk and Steward, John C. Kersey. Fratton, $1\frac{1}{2}$ miles. *See also Advt., p. 83*

Prestwich (near Manchester).—*County Mental Hospital*. Res. Med. Supt., Dr. D. Blair. Prestwich, $\frac{1}{2}$ mile.

Rainhill (nr. Liverpool).—*County Mental Hospital*. Res. Med. Supt., Dr. E. F. Reeve. St. Helens, $2\frac{1}{2}$ miles; Rainhill, 1 mile.

Rotherham (Yorkshire).—*The Grange*, 5 miles from Sheffield (for Ladies). Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Grange Lane station, L. & N.E.R., $\frac{1}{2}$ mile. *See also Advt., p. 115*

St. Albans.—*Herts County Mental Hospital*, Hill End. Res. Med. Supt., Dr. W. J. T. Kimber. Hill End station, L. & N.E.R. (G.N. Section), 3 minutes. *See also Advt., p. 118*

Napsbury Mental Hospital (under the Middlesex County Council), near St. Albans, Herts. Res. Med. Supt., Arthur O'Neill, O.B.E., M.R.C.S., L.R.C.P. Napsbury, L.M. & S.R., 5 minutes' walk.

St. Leonards-on-Sea.—*Ashbrook Hall*, Hollington (for ladies). Res. Lic., Charles E. H. Somerset. Warrior Square station, 2 miles.

Salisbury.—*Laverstock House*, Salisbury. Med. Supt., J. R. Benson, F.R.C.S., L.R.C.P. Salisbury, $1\frac{1}{2}$ miles. *See also Advt., p. 106*
Old Manor Mental Hospital, Salisbury. Med. Supt., Dr. S. E. Martin. Salisbury station, S.R. and G.W.R., 5 minutes. *See also Advt., p. 113*

Shrewsbury.—*Salop Mental Hospital*, Bicton Heath. Res. Med. Supt., W. S. Hughes, M.B., B.S. Shrewsbury, $2\frac{1}{2}$ miles.

Sleaford.—*Rauceby Mental Hospital*. Res. Med. Supt., N. K. Henderson, B.A., LL.B., M.B., Ch.B., D.P.H., D.P.M. Rauceby, L. & N.E.R., $\frac{1}{2}$ mile.

Sligo.—*District Mental Hospital*. Res. Med. Supt., Dr. John Dunne. Sligo, $1\frac{1}{2}$ miles.

Stafford.—*County Mental Hospital*. Res. Med. Supt., B. H. Shaw, M.D. Stafford, 1 mile.

Coton Hill Mental Hospital, Stafford. Res. Med. Supt., R. MacDonald, M.D., D.P.M. Stafford, 1 mile.

See also Advt., p. 117

Stirling.—*District Mental Hospital*, Larbert. Med. Supt., R. B. Campbell, M.D. Larbert, L.M. & S.R., $1\frac{1}{2}$ miles.

Stone (near Aylesbury).—*Bucks Mental Hospital*. Res. Med. Supt., H. Kerr, M.D. Aylesbury, $3\frac{1}{2}$ miles.

Swansea.—*Swansea and Merthyr Tydfil Joint Mental Hospital*, Cefn Coed. Med. Supt., J. S. I. Skottowe, M.D., D.P.M. Clerk and Steward, J. R. Barnes.

Talgarth.—*Mid-Wales Counties Mental Hospital*. Res. Med. Supt., Dr. P. Drummond. Talgarth, 1 mile.

Tamworth (Staffs).—*The Moat House* (for ladies). Res. Medical Attendant, Dr. W. Lowson. Tamworth station, $\frac{1}{2}$ mile.

Taunton.—*Somerset & Bath Mental Hospital*, Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Norton Fitzwarren station, 2 miles.

Ticehurst (Sussex).—*Ticehurst House*. Res. Med. Supt., C. F. F. McDowall, M.D. Wadhurst, 4 miles, or Ticehurst Rd., 3 miles.

Virginia Water.—*Holloway Sanatorium*, Registered Mental Hospital, St. Ann's Heath. Res. Med. Supt., Henry Devine, O.B.E., M.D., B.S., F.R.C.P. Asst. Med. Offs., Thomas E. Harper, M.R.C.S. (Eng.), L.R.C.P. (Lond.), Cecil Rutherford, B.A., M.B., B.Ch., B.A.O., John G. Hamilton, M.B., B.S. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.P.M., Harriette Grenelle Bogle, M.B., Ch.B., M.D. (Edin.). Virginia Water station, 5 minutes. Seaside Branch, St. Ann's, Canford Cliffs, Bournemouth. Med. Off., C. G. Cowie, M.D. *See also Advt., p. 111*

Wadsley (near Sheffield).—*South Yorkshire Mental Hospital*. Res. Med. Supt., W. J. N. Vincent, M.D. Wadsley Bridge, 1 mile (goods); Sheffield, 4 miles (passengers).

Wakefield.—*West Riding Mental Hospital*. Res. Med. Supt., Prof. J. Shaw Bolton, M.D. Kirkgate and Westgate stations, 1 mile.

Wallingford (Berks).—*Berkshire Mental Hospital*. Res. Med. Supt., Dr. Walter Woolfe Read. Cholsey, 1 mile.

Warlingham (Surrey).—*Croydon Mental Hospital*. Res. Med. Supt., H. M. Berncastle, M.R.C.S., L.R.C.P. Upper Warlingham, $3\frac{1}{2}$ miles.

Warrington (Lanes).—*Lancashire County Mental Hospital*, Winwick. Res. Med. Supt., F. M. Rodgers, O.B.E., M.D., D.P.H. Warrington, $2\frac{1}{2}$ miles.

Waterford.—*Bon Sauveur Mental Home*, Carriglea, Dungarvan, Co. Waterford. (For ladies.) Conducted by the Order of Bon Sauveur. Vis. Phys., Dr. D. T. McCarthy. Dungarvan station, $3\frac{1}{2}$ miles.

District Mental Hospital, Waterford. Res. Med. Supt., Dr. Alexis FitzGerald. G.S. & W.R., North station, 2 miles.

St. Patrick's Private Mental Hospital, Belmont Park, Waterford. (For gentlemen.) Conducted by the Brothers of Charity. Vis. Phys., Dr. M. Coghlan. Waterford station, 1 mile.

Wells.—*The Mental Hospital*, Wells, Som. Res. Med. Supt., Dr. J. McGarvey. Wells station, S. & D.J.R., and G.W.R., $1\frac{1}{2}$ miles.

Whittingham (near Preston).—*County Mental Hospital.* Res. Med. Supt., Dr. A. R. Grant. Preston, 7 miles.

Winchelsea (Sussex).—*Peritau House,* near Hastings (for ladies). Physician, Harvey Baird, M.D. Winchelsea station, 1 mile.

Woking (Surrey).—*County Mental Hospital,* Brookwood. Res. Med. Supt., J. A. Lowry, M.D. Brookwood station, 1½ miles.

Worcester.—*County & City Mental Hospital,* Powick. Res. Med. Supt., Dr. H. F. Fenton. Worcester station, 4 miles.

York.—*Bootham Park Registered Hospital,* York. Res. Med. Supt., G. R. Jeffrey, M.D. York station, 1 mile.

See also Advt., p. 120

The Friends' Retreat, York. Res. Med. Supt., Dr. Neil Macleod. York station, 1½ miles.

The Pleasaunce, York. Phys. Supt. and Res. Licensee, Dr. Janie S. Baugh. York station, 1½ miles. *See also Advt., p. 80*

North Riding of Yorkshire Mental Hospital, Clifton, York. Res. Med. Supt., Dr. J. I. Russell. York, 2 miles.

York City Mental Hospital, Fulford, York. Res. Med. Supt., Dr. R. A. Hooper. Naburn, L. & N.E.R., 1 mile.

MENTAL DEFICIENCY ACT, 1913: CERTIFIED INSTITUTIONS AND HOUSES.

Class A.—Certified Institutions. *Class B.*—Institutions approved under Section 57.

Class C.—Certified Houses. *Class D.*—Approved Homes.

BEDFORDSHIRE.

Bromham House, Bromham, near Bedford. For 24 males. Supt., M. Wallenger. (*Class A.*)

BERKSHIRE.

Cumnor Rise, Oxford. — 34 females. High-grade feeble-minded. Supt., Miss Carter. (*Class A.*)

BUCKINGHAMSHIRE.

The Manor House Institution, Aylesbury. For 56 males and 43 females. Supt., Miss E. Boughton. Managers, Bucks Mental Deficiency Committee. (*Class A.*)

Winslow Institution, Winslow. — (For Bucks County cases only.) 8 male, 38 female, adults. Feeble-minded and imbecile. Supt., J. Burden. (*Class B.*)

CARMARTHENSHIRE.

Pantglass Hall, Llanfynydd Road, Carmarthen. For 117 females. Supt., Miss M. C. Treharne-Jones. (*Class A.*)

CHESHIRE.

Ashton House, 26, Village Road, Oxton, Birkenhead. For 40 females (high grade). Supt., Miss O. M. Wilkinson. (*Class A.*)

The Mary Dendy Home, Sandlebridge, near Alderley Edge. — 425 males and females. Educable mentally defective children under 13 years of age. President, Carey M. Bowden, Esq., J.P. Sec., E. M. Richards, 72, Bridge Street, Manchester. (*Class A.*)

CUMBERLAND.

Dovenby Hall Colony, Cockermouth. — For 185, both sexes. Supt., Miss S. J. Bevan. (*Class A.*)

Durrant Hill House, Carlisle. — 65 females. Feeble-minded. Higher grade. Supt., B. Purcell. (*Class A.*)

DERBYSHIRE.

Thornhill, Trowels Lane, Derby. — For females. Supt., Miss S. McGarvie. (*Class A.*)

Whittington Hall, Whittington, near Chesterfield. — 400 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control, 14, Howick Place, Victoria Street, S.W.1. (*Class A.*)

DEVON.

Royal Western Counties Institution, Starcross. — 662 males and females (trainable children and adults). Sec. Supt., C. W. Mayer. (*Class A.*)

Stoke Lyne, Withycombe, Exmouth. — 50 males. Managers, Devon County Council. Supt., Miss H. E. Darlington. (*Class A.*)

DURHAM.

Monkton Hall Home for Lads, Jarrow-on-Tyne. — 79 males. Supt., Mrs. A. H. Piggott. (*Class A.*)

Shotley Bridge Colony, Shotley Bridge, Durham. — 227 males, 173 females. Matron, Miss H. L. C. Yates. (*Class A.*)

ESSEX.

Bigods Hall, R. C. Special School, near Dunmow. — 61 high-grade boys. Corresponding Manager, Rev. Sr. Rosalie Dunne. Chigwell Convent, Woodford Bridge, Essex. Supt., Sr. J. Scully. (*Class A.*)

Brunswick House, Mistley, Essex. — 75 males (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt., S. E. Dudley. (*Class A.*)

Elloe House, Church Road, Leyton. — 102 high-grade feeble-minded females over 16. Supt., Sr. C. Keogh. (*Class A.*)

Royal Eastern Counties Institution Ltd., Colchester. — 1430 males and females, all grades. Med. Supt., Dr. F. D. Turner. (*Class A.*)

South Ockenden Colony, South Ockenden, Essex. — 84 males, 52 females. Supt., Miss W. S. Butler. (*Class A.*)

The Mutual Sanatorium, Billericay, Essex.—54 males of the middle class. Supt. Sec., Mr. A. J. Read. (Class A.)
Walsham How Home, 1, Forest Rise, Walthamstow, E.17. Sec., Sister George, Church Army, 57, Bryanston Street, W.1. For 45 females. (Class A.)

FLINT.

Coed du Hall, Rhydyrnwyn, near Mold.—For females. Supt., Miss M. P. Elder. (Class A.)

GLAMORGANSHIRE.

Hensol Castle, Pontyclun, Glam. 100 males. *Drymma Hall, Skewen, near Neath.* 79 females. Res. Med. Supt., Dr. E. Lewis. (Class A.)

GLOUCESTERSHIRE.

Brentry Colony, Westbury-on-Trym, Bristol.—358 males over 18 years of age. Res. Med. Supt., Dr. G. de M. Rudolf. Henbury station, 1½ miles. (Class A.)

Hortham Colony (City and County of Bristol), Almondsbury, near Bristol.—304 males, 304 females. Res. Med. Supt., Walter Wyatt, M.B., B.Ch. (Edin.), D.P.M. (Class A.)

Royal Fort Home, St. Michael's Hill, Bristol.—30 females, high-grade mentally deficient. Hon. Sec., Mrs. Brown, "Trecarrel," Rylestone Grove, Parry's Lane, Bristol. (Class A.)

St. Mary's Home, Painswick, Stroud, Glos.—29 females. High-grade feeble-minded. Apply, Lady Supt. (Class A.)

Stoke Park Colony, Hanham Hall, Hanham, near Bristol.—240 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stoke Park Colony, Royal Victoria Home, Horfield.—42 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stoke Park Colony, Stapleton, Bristol.—790 patients of both sexes. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.) See also *Advt.*, p. 84

Stoke Park Colony, West Side, Stapleton.—348 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stapleton Institution, Bristol.—100 adult males, 100 females and 40 children. Superintendent, A. F. Waters. (Class B.)

HAMPSHIRE.

Coldeast Colony, Sarisbury, near Southampton. 370, both sexes. Vis. Med. Off., Dr. K. W. Mackie. Matron, Mrs. E. K. Bushell. (Class A.)

Mount Tabor, Basingstoke, Hants.—Church of England institution for 50 high-grade females over 16 years of age. Vis. Med. Off., Dr. Kelly. Supt., The Rev. Mother Superior, Sisters of the Transfiguration. (Class A.)

St. Mary's Home, Alton.—45 mentally and morally deficient females. Managers, The Wantage Community of Sisters. Supt., The Sister Superior. (Class A.)
Tatchbury Mount Colony, West Totton, Southampton.—56 males. Supt., W. M. Worlock. (Class A.)

HERTS.

Cell Barnes Colony, St. Albans, Herts.—Both sexes. Med. Supt., Dr. H. N. M. Burke. (Class A.)

Hillside Special School for Mentally Defective Boys, Buntingford.—48 males under 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

St. Elizabeth's Home for Epileptics, Much Hadham.—56 children; 54 female adults. Apply to Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

St. Raphael's Colony, Barvin Park, near Potter's Bar, Herts.—43 epileptic and mental defective males over 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

Rowley Lodge, Rowley Green, Barnet.—Educational home for 14 very backward boys and girls. Principal, Miss Wall. (Class A.) See also *Advt.*, p. 78

The Middlesex Colony for Mental Defectives, Harper Lane, Shenley, near St. Albans.—336 males. Managers, Middlesex County Council. Res. Med. Supt., Dr. H. E. Beasley. (Class A.)

Leavesden Mental Hospital, Abbot's Langley, Watford, Herts.—2232 London cases only (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., R. M. Stewart, M.D., F.R.C.P., D.P.M. (Class B.)

Boxmoor House School, Boxmoor, Herts.—10 males under 14, and 10 females. Principals, Misses J. M. and M. D. Isbister. (Class C.)

KENT.

Leybourne Grange Colony, West Malling, near Maidstone.—Females only. Med. Supt., Dr. R. F. Jarrett. (Class A.)

Princess Christian's Farm Colony, Hildenborough.—71 certified males, 68 certified females, 18 approved home cases. Managers, National Association for the Feeble-minded. Superintendent, Miss Pitman. (Classes A and D.)

Darenth Training Colony, near Dartford, Kent.—2260 London cases only (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., J. K. C. Laing, M.B., B.S., D.P.M. (Class B.)

LANCASHIRE.

Allerton Priory R.C. Special School, Woolton, Liverpool.—123 female educable children. Cor. Manager, Rev. J. Bennett, 93, Shaw Street, Liverpool. Supt., Sister A. Pound. (Class A.)

Calderstones, Whalley, near Blackburn.—1192 males, 1534 females. Feeble-minded, imbeciles, idiots, and moral defectives. Managers, Mental Deficiency Acts Committee, Lancashire Mental Hospitals Board, Preston. Res. Med. Supt., Frank A. Gill, M.D. (Class A.)

Dovecot Certified Institution, Knotty Ash, Liverpool. 64 females. Supt., Miss F. E. Eyre. (Class A.)

Moss Side, Maghull, Liverpool. 150 males and 156 females, over 16 years of age and of dangerous or violent propensities. Med. Supt., C. H. Gostwyck, M.B. Managers, The Board of Control, Caxton House West, Tothill Street, S.W.1. (Class A.)

Pontville R.C. Special School, Ormskirk.—121 boys under 16. Mentally defective. Cor. Manager, Rev. J. Bennett, 93, Shaw Street, Liverpool. (Class A.)

Royal Albert Institution, Lancaster.—800 of both sexes. Managers, The Central Committee of the Royal Albert Institution, Lancaster. Res. Med. Supt., Dr. W. H. Coupland. Secretary, Samuel Keir. (Class A.) See also Advt., p. 84

Seafeld House, Waterloo Road, Seaforth, near Liverpool.—101 male, 124 female feeble-minded children. Managers, Liverpool City Council, Liverpool. Res. Supt. in Charge. (Class B.)

LEICESTERSHIRE.

Leicester Frith, Groby Road, Leicester.—120 males, 180 females. Supt., Miss N. Russam. Managers, City of Leicester Mental Deficiency Committee, Alliance Chambers, Horsefair Street, Leicester. (Class A.)

LONDON.

South Side Home, Streatham Common, S.W.16. 80 females (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt., Miss H. G. Hollyer. (Class A.)

The Helping Hand Home, 16, Cathcart Hill, N.—29 females. High-grade mental defectives. Matron, Miss Caleb. Managers, Committee; Hon. Sec., Mrs. Geoffrey Russell, J.P., 17, Church Row, Hampstead, N.W.3. (Class A.)

St. Teresa's, 97, Belmont Hill, Lewisham. 120 females. Supt., Sister A. Friel. (Class A.)

Fountain Mental Hospital, Tooting Grove, Tooting Graveney, S.W.17. 670 low-grade unimprovable children (London cases only, of both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., J. Nicoll, M.D., C.M., D.P.H. (Class B.)

MIDDLESEX.

All Souls' Special School, Field Heath House, Hillingdon.—120 educable females under 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

Bramley House, Clay Hill, Enfield.—50 females. Managers, Middlesex County Council. Supt., Miss A. Swift. (Class A.)

St. Ann's Hostel, 64, St. Ann's Hill, Wandsworth. 15 feeble-minded girls. Sec., Sister George, Church Army, 55, Bryanston Street, Marble Arch, W.1. (Class A.)

St. Raphael's Institution, The Butts, Brentford.—60 females. Supt., Miss A. Dwyer. (Class A.)

Normansfield, Teddington.—150 males and females of all ages. Med. Supt., Dr. R. L. Langdon-Down. (Class C.)

See also Advt., p. 86

Alexander House, 117, High Street, Uxbridge.—24 females over 16. Vis. Med. Off., Dr. Black. Supt., Miss E. Collyer. (Class D.)

Conifers, Teddington.—22 females, and 3 male children. Med. Supt., Dr. R. L. Langdon-Down. (Class D.)

Trematon, Teddington.—24 males. Med. Supt., Dr. R. L. Langdon-Down. (Class D.)

NORFOLK.

Heckingham Institution, Norfolk.—For both sexes. Supt., W. L. Hill. (Class A.)

The Lodge, Bowthorpe Road, Norwich.—6 adult males, 20 adult females. Managers, The Corporation of Norwich. Supt., F. R. Smith. (Class B.)

NORTHUMBERLAND.

Prudhoe Hall Colony, Prudhoe-on-Tyne.—422 of both sexes. Supt., Miss N. M. Hawkes. (Class A.)

NOTTINGHAMSHIRE.

Rampton State Institution, near Retford.—Both sexes of violent and dangerous propensities. 652 males, 499 females. Med. Supt., F. E. E. Schneider, M.D., D.P.M. Managers, The Board of Control, Caxton House West, Tothill Street, S.W.1. (Class A.)

SOMERSET.

House of Help (Bath Preventive Mission), 112, Walcot Street, Bath.—66 females. Hon. Vis. Med. Off., Dr. D. L. Beath. Supt., Miss H. D. Stegeman. (Class A.)

Stoke Park Colony, Leigh Court, Abbot's Leigh, nr. Bristol.—260 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Rock Hall House, Combe Down, Bath.—18 males, 20 females. Supt., Miss L. S. Davison. (Class A.)

Yatton Hall, Yatton, near Bristol (ancillary premises to Sandhill Park).—76 of both sexes (65 under 16 years, 11 young women). Managers, Somerset County Council. Supt., Miss J. McGill. (Class A.)

Sandhill Park, Bishop's Lydeard.—101 females and 60 males, of 16 years and over, and 100 school children under Education Act. Managers, Somerset County Council. Supt., Miss T. Wood. (Class A.)

West End House, Shepton Mallet (ancillary premises to *Sandhill Park*).—129 females of 16 years and over. Managers, Somerset County Council. Supt., Miss E. B. Stalker. (Class A.)

Cambridge House, Flax Bourton, Bristol (ancillary premises to *Sandhill Park*).—104 males of 16 years and over. Managers, Somerset County Council. Supt., Mr. W. Lombard. (Class A.)

STAFFORDSHIRE.

New Cross Institution, Mental Wards, Wolverhampton.—8 males, 3 females. Managers, County Borough Council of Wolverhampton. Supt., T. D. Rollinson. (Class B.)

Sedgley Poor Law Institution, Burton House, Dudley, Stafford.—50 males, 65 females. Managers, Staffordshire County Council. Master, P. Hopkin. (Class B.)

Stalington Hall, Blythe Bridge, Stoke-on-Trent. 33 males, 44 females. Supt., Miss M. A. Cahill. (Class A.)

STIRLINGSHIRE.

The Royal Scottish National Institution, Larbert. For 560 pupils of both sexes and all grades. Res. Med. Supt., R. D. Clarkson, M.D., F.R.C.P. Edin. (Classes A and C.) See also Advt., p. 83

SUFFOLK.

Handford Home, Ranelagh Road, Ipswich.—22 high-grade females. Managers, Ipswich Corporation. Supt., Miss D. B. Miller. (Class A.)

St. Joseph's Home, The Croft, Sudbury.—27 high-grade females. Lady Supt., Sister Catherine. (Class A.)

SURREY.

Eagle House, London Road, Mitcham. For females. Supt., Miss M. Blandford. (Class A.)

Ellen Terry National Home for Blind Defective Children, Wray Park Road, Reigate. For both sexes. Matron-Supt., Miss E. M. Cooke. (Class A.)

Farmfield, Horley, Surrey.—141 males of criminal experience or intractable disposition (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt., A. J. Oldfield. (Class A.)

Royal Earlswood Institution, Redhill.—350 males, 180 females. Res. Med. Supt., Dr. S. Langton, Sec., Mr. H. Stephens, 14, Ludgate Hill, E.C.4. (Class A.)

See also Advt., p. 78

The Manor, Epsom, Surrey.—1292 (both sexes). (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., E. S. Litteljohn, M.R.C.S., L.R.C.P. (Class A.)

Caterham Mental Hospital, Caterham, Surrey.—2103 London cases only (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., T. Lindsay, M.D., F.R.C.S., D.P.M. (Class B.)

SUSSEX.

The Hermitage Training Home, Fairwarp, near Uckfield. For females. Supt., Miss M. Walton. (Class A.)

Tubacell Farm, Jarvis Brook, near Crowborough. For males only. Supts., Mr. and Mrs. A. Spicer.

WARWICKSHIRE.

Agatha Stacey Home, Rednal, near Birmingham.—40 females. Supt., Miss D. O. Hall. (Class A.)

Coleshill Hall, near Birmingham.—120 males, 180 females. Res. Med. Supt., Dr. H. Freize Stephens. (Class A.)

Great Barr Park Colony, Great Barr, near Birmingham.—315 males, 341 females. Cot and chair cases, both sexes, 27. Res. Med. Supt., Dr. D. M. Macmillan. (Class A.)

Midland Counties Institution, Knowle, near Birmingham.—180 males. Supt., S. H. Thornton. Med. Officer, J. O. Hollick, M.B. (Class A.)

Monyhull Colony, Monyhull Hall Road, King's Heath, Birmingham.—583 males, 660 females. Med. Supt., Dr. A. M. McCutcheon. (Class A.)

Warwickshire Weston Colony, Weston-under-Weatherley, near Leamington Spa.—40 males, 18 females. Supt., A. B. Lane. (Class A.)

WILTS.

Devizes Poor Law Institution.—17 females, 32 males. Managers, Devizes Area Guardians Committee. Supt., N. T. Fear. (Class B.)

Poor Law Institution, Semington, near Trowbridge. 22 males, 36 females. Managers, Trowbridge Area Guardians Committee. Supt., C. H. Taylor. (Class B.)

WORCESTERSHIRE.

Besford Court Catholic Mental Welfare Hospital for Children, Besford, near Defford.—250 senior, 130 junior, males. Res. Manager, The Right Rev. Monsignor T. A. Newsome. (Class A.)

YORKSHIRE.

The Kepstorn Institution, Kirkstall, Leeds.—40 adult females. Managers, Leeds City Council. Executive Officer, Mr. S. Wormald, 38, Park Square, Leeds. Matron, Miss A. Riley. (Class A.)

Meanwood Park Colony, Meanwood, Leeds. 160 males, 268 females. Managers, Leeds City Council. Executive Officer, Mr. S. Wormald, 38, Park Square, Leeds. Matron, Miss C. Surtees Wilson. (Class A.)

Mid-Yorkshire Institution, Whizley, York.—214 males. Managers, The Mid-Yorkshire Joint Board. Supt., Capt. J. Brown, I.S.O. (Class A.)

INSTITUTIONS AND HOMES FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879-1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an 'Inebriate' within the meaning of the Acts.

*NOTE—Recclesfield, Ashford, is a Roman Catholic Religious Institution.

MALES ONLY.

Nuneaton (Warw.).—*Caldecote Hall* (C.E.T.S. Institution). Res. Med. Supt., Alfred E. Carver, M.D. Nuneaton, 2½ miles.
See also Advt., p. 87

Rickmansworth (Herts.).—*Dalrymple House*. Apply to the Res. Med. Supt. Rickmansworth station, Joint G.C. and Metropolitan Railway, ½ mile; L.M. and S.R., 1 mile.

FEMALES ONLY.

Ashford (Middlesex).*—*Ecclesfield*. Med. Supt., Dr. J. Scott. Apply, Mother Superior. Ashford station, 1 mile.

Belfast.—*The Lodge Retreat*, Dundela Avenue, Holywood Road. Med. Attend., Muriel Price, M.D. Matron, Miss E. M. Watt. Stations 20-30 minutes by tram.

Thorpe, near Chertsey.—*Spelthorne St. Mary*. Apply to the Sister Superior, C.S.M.V. Med. Supt., Dr. W. Dale.

UNLICENSED HOMES.

Chislehurst (Kent).—*Old Hill House Ltd.* Res. Med. Supt., Walter E. Masters, M.D. Chislehurst station, 4 minutes.

Paignton (Devon).—*Bay Mount*, small private home for both sexes. Res. Med. Supt., Dr. Stanford Park.

Woodbridge (Suffolk).—*Norwood Sanatorium Ltd.*, Rendlesham Hall, Woodbridge. Wickham Market station. Telephone and Telegrams: Wickham Market 16.
See also Advt., p. 87

SANATORIA FOR TUBERCULOSIS,
PULMONARY AND NON-PULMONARY.

Aberchlder (N.B.).—*Inverness-shire Sanatorium, Invergarry*. Med. Supt., J. Kirton, M.C., M.A., M.D. Aberchlder, 2 miles.

Abergele, North Wales.—*Abergele Sanatorium*. For Manchester cases. Med. Supt., J. E. Geddes, M.D.

Ashford (Kent).—*Grosvenor Sanatorium*, Ashford. Res. Med. Supt., J. A. Milne, M.B., Ch.B., D.P.H. Ashford Junction, 2 miles.

Axbridge (Somerset).—*St. Michael's Home for Consumptives*. For members of the Church of England. Med. Off., Dr. R. W. Statham. Apply, Sister-in-Charge.

Aysgarth (Yorks).—*Wensleydale Sanatorium*. Physicians, D. Dunbar, M.B., B.S., and W. N. Pickles, M.D., B.S. Aysgarth, ½ mile, via Northallerton, L. & N.E.R., and Hawes Junction, L.M. & S.R.
See also Advt., p. 92

Baguley (Cheshire).—*Baguley Sanatorium*. For Manchester cases. Res. Med. Supt., H. G. Trayer, M.B., D.P.H. Baguley, 1½ miles.

Barrasford (Northumberland).—*The Newcastle-on-Tyne Sanatorium*. Res. Med. Supt., Dr. C. G. R. Goodwin. Barrasford, L. & N.E.R., 4 miles.

Benenden (Kent).—*Sanatorium of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis."* Res. Med. Supt., Dr. H. Spurrier. Bidenden, 3 miles.

Bingley (Yorks).—*Eldwick Sanatorium* (West Riding County Council school for phthisical children). Med. Off., Dr. Margaret S. Sharp. Bingley station, 2 miles.

Birmingham.—*City Sanatorium*, Yardley Green Road, Smallheath. Res. Med. Supt., Dr. G. B. Dixon. Stechford, L.M. & S.R.

Romsley Hill Sanatorium, Halesowen, Worcestershire. Res. Med. Supt., Dr. P. J. Bodington. Birmingham Corporation Sanatorium. Halesowen, 4½ miles.

Bolton (Lancs.).—*Wilkinson Sanatorium for Consumptives*, Sharples. Med. Off., Dr. W. Rolland. Bolton, 2 miles.

Boston (Lincs).—*Holland Sanatorium*. Med. Supt., W. G. Booth, M.D., D.P.H. Boston, 1 mile.

Bournemouth.—*Royal National Sanatorium for Consumption and Diseases of Chest*. Sec., A. G. A. Major. Res. Med. Off., D. A. Hutcheson, M.D. Bournemouth Central, 1½ miles; Bournemouth West, ¼ mile.

The Firs Home (for advanced cases of consumption). Hon. Sec., Col. R. F. Anderson. Hon. Treas., A. J. Drewe, Esq. Hon. Med. Offs., C. P. Woodstock, M.D., and S. G. Champion, M.D. Lady Supt., Miss Ingram. Bournemouth Central, $\frac{1}{2}$ mile.

Bovey Tracey (Devon).—*Devon County Sanatorium*, Hawkmoor. Res. Med. Supt., Dr. J. C. Smyth. Bovey, 3 miles; Lustleigh, 2 miles.

Bradford.—*Bierley Hall Sanatorium*, Bierley Lane. For 60 men and women. Res. Med. Supt., Dr. J. W. Starkey. Bradford, 3 miles.

Braintree (Essex).—*Black Notley Sanatorium*. Res. Med. Supt., Dr. M. C. Wilkinson. Sec., Clerk of County Council, Shire Hall, Chelmsford. Crassing, 1 mile.

Bridge of Weir (Renfrewshire).—*Consumption Sanatoria of Scotland*. Res. Med. Supt., E. J. Peill, M.B., Ch.B., F.R.C.S.E. Sec., Wm. A. Findlay. Bridge of Weir, 2 miles.

Brighton.—*Municipal Sanatorium*, for Brighton townfolk only (pulmonary and joints). Med. Supt., Dr. Duncan Forbes, M.O.H., Royal York Buildings, Brighton. Brighton Central stat., $1\frac{1}{2}$ mls.

Bristol.—*Frenchay Park Sanatorium and Orthopaedic Hospital for Bristol Children*, Frenchay, near Bristol. Res. Med. Supt., Dr. K. H. Pridie. Under the control of the M.O.H. Dept., Bristol. Staple Hill station, L.M. & S.R., $1\frac{1}{2}$ miles.

Buttevant (Co. Cork).—*Cork County and City Sanatorium*, Heatherside. Res. Med. Supt., Dr. R. Ahern. Buttevant, G.S. & W.R., 6 miles.

Camberley (Surrey).—*Prior Place Sanatorium*, Heatherside. Res. Med. Supt. Dr. H. O. Blanford.

Camborne (Cornwall).—*Tehidy Sanatorium*. Res. Med. Supt., Dr. F. Chown. Camborne, 3 miles.

Cambridge.—*Papworth Village Settlement*. Med. Director, Sir Penderill Varrier-Jones, M.A., M.R.C.P. Huntingdon station, 6 miles; Cambridge, 12 miles.

Chandler's Ford (Hants).—*Hants County Council Sanatorium*. Res. Med. Supt., Dr. W. J. Hart. Chandler's Ford, 1 mile.

Cheltenham and Gloucester.—*The Cotswold Sanatorium*, Cranham, Gloucester. Med. Supt., Geoffrey A. Hoffman, B.A., M.B., T.C. (Dub.). Asst. Phys., Margaret A. Harrison, M.B., B.S. (Lond.). Cons. Laryng., Sidney Bernstein, M.R.C.S., L.R.C.P. (Lond.). Cheltenham, Gloucester, or Stroud, all 8 miles.

See also *Advt.*, p. 90

Salterley Grange Sanatorium, near Cheltenham. Res. Med. Supt., Dr. D. J. Peebles. Leckhampton, $2\frac{1}{2}$ miles; Cheltenham, $3\frac{1}{2}$ miles.

Dagenham (Essex).—*West Ham Sanatorium*, for adults; *Langdon Hills Sanatorium*, Laindon, Essex, for children. Med. Supt., Dr. G. M. Mayberry.

Darlington.—*Felix House*, Middleton St. George, Co. Durham. Res. Med. Supt., C. S. Steavenson, M.B. Dinsdale, N.E.R., 3 minutes.

Davos-Platz (Switzerland).—*Park Sanatorium* (formerly *Felix Sanatorium Turban*), Davos-Platz. Res. Med. Supt., F. Bauer, M.D. Davos-Platz, 10 minutes.

See also *Advt.*, p. 88

The Schatzalp Sanatorium, Davos-Platz. Res. Med. Supt., Edward C. Neumann, M.D. Davos-Platz station and Schatzalp funicular. See also *Advt.*, p. 96

Derbyshire.—*Derbyshire County Sanatorium*, Walton, near Chesterfield. Med. Supt., A. N. Robertson, M.D. Chesterfield, $1\frac{1}{2}$ miles.

Devon and Cornwall Sanatorium, Didworthy, South Brent. For consumptives of the two counties. Sec., S. Carlile Davis, Esq., M.B.E., 5, Princess Square, Plymouth. Res. Med. Off., Dr. A. T. Bettinson. Brent, G.W.R., 2 miles.

Dublin.—*Peamount Sanatorium*, New-castle, Co. Dublin. Res. Med. Supt., A. Barry, F.R.C.P.I. Lucan, 2 miles.

Dundee (near).—*Sidlaw Sanatorium*, Auchterhouse, 80 beds for children. (In connection with Dundee Royal Infirmary. Med. Supt., H. J. C. Gibson, M.D.). Vis. Phys., W. E. Foggie, D.S.O., M.D. Vis. Surg., John Anderson, D.S.O., F.R.C.S.E. Matron, Miss Ellen Norris. Sec., W. F. Ferguson. Auchterhouse station, $1\frac{1}{2}$ miles.

Durham.—*Sanatoria of the Durham County Council*: *Earls House Sanatorium*, near Durham. Med. Supt., J. Menzies Cormack, M.B., Ch.B., D.P.H. *Hollywood Hall*, Wolsingham. Res. Med. Supt., J. W. Gray, M.D. Wolsingham station, L.N.E.R., $1\frac{1}{2}$ miles. *Seaham Hall*, near Seaham Harbour. Res. Med. Supt., Dr. W. C. Pinkney.

Sanatoria of the Durham County Consumption Society. Sec., Mr. F. Forrest, 54, John Street, Sunderland. Vis. Med. Supt., Dr. G. S. Robinson. For men and boys: *Horn Hall*, Stanhope. Med. Off., Dr. J. O'Hara. Stanhope station, 1 mile. For women and children: *The Leazes House*, Wolsingham. Med. Off., Dr. J. F. McConchie. Wolsingham station, $\frac{1}{2}$ mile.

Durtol (Puy-de-Dôme), France.—*Sanatorium du Chateau de Durtol*. Director, Dr. Paul Labesse. See also *Advt.*, p. 88

East Fortune (East Lothian).—*East Fortune Sanatorium*. Res. Med. Supt., Chas. Cameron, M.D. East Fortune, $\frac{1}{2}$ mile.

Ecclefechan, by Lockerbie.—*St. Fechan's Sanatorium*, for boys. Res. Med. Off., Dr. F. A. Collington. Ecclefechan station, 1 mile.

Fortbreda, Belfast.—*Forster Green Hospital for Consumption and Chest Diseases.* Med. Supt., B. R. Clarke, M.D. Sec., J. Osborne, 99-103, Scottish Provident Buildings, Belfast. Belfast, 2 miles.

Frimley (Surrey).—*Brompton Hospital Sanatorium.* Res. Med. Supt., Dr. R. C. Wingfield. Frimley station, 2 miles.

Burrow Hill Sanatorium Colony, St. Catherine's Road, Frimley, Surrey. For youths between 14 and 19 years. Res. Med. Supt., Dr. Alex. Hill Macpherson. Frimley station, 1½ miles.

Grange-over-Sands.—*Westmorland Sanatorium, Meathop.* Res. Med. Supt., J. Munro Campbell, M.B., Ch.B., D.P.H. Grange-over-Sands station, 2 miles.

Gt. Barrow, Chester.—*East Lancashire Tuberculosis Colony and Sanatorium, Barrowmore Hall.* Occupational treatment. Res. Med. Supt., Dr. E. L. Sandiland. Chester, 6 miles.

Harefield (Middlesex).—*Middlesex County Sanatorium.* Res. Med. Supt., Dr. J. R. McGregor. Denham station, 3 miles. Clerk, Middlesex Guildhall, Westminster, S.W.1.

Harpenden (Herts).—*Sanatorium of the National Children's Home and Orphanage.* Harpenden station, L.M. & S.R. Vis. Phys., T. N. Kelynaack, M.D., J.P. and A. V. Kelynaack, M.R.C.S., L.R.C.P. Principal, Rev. John H. Litten, Highbury Park, London, N.5. See also *Advt.*, p. 89

Hastings.—*Fairlight Sanatorium*, in connection with Margaret Street Hospital for Consumption (for Out-Patients), 26, Margaret St., W. Sec., Mrs. M. C. Hawthorne. Med. Off., Dr. N. F. Stallard. Hastings, tram, about 15 minutes.

Heath End (Surrey).—*Church Army Sanatorium for Consumptive Boys.* Med. Off., Dr. W. B. Vaile. Sec., Capt. Hanmore, Church Army. 55, Bryanston Street, W.1.

Heswall (Cheshire).—*Cleaver Sanatorium for Children.* 200 beds. Med. Supt., J. B. Yeoman, M.D. Matron, Miss D. Kelsall. Heswall, 1½ miles.

Hexham (Northumberland).—*Wooley Sanatorium.* Res. Med. Supt., Dr. R. Cunningham. Corbridge, 5 miles.

Huntingdon.—*Wyton Sanatorium* (Hunts County Council), for women and children. Med. Off., Dr. C. B. Moss-Blundell. Huntingdon, 3½ miles.

Ilkley (Yorks).—*Middleton Sanatorium*, near Ilkley. Res. Med. Supt., T. Campbell, M.D. Ben Rhydding, 1½ miles.

Isle of Wight.—*Royal National Hospital for Consumption, Ventnor.* Med. Supt., Dr. G. Oliver Hempson. Sec., H. R. Rowe, 18, Buckingham Street, Strand, W.C.2. See also *Advt.*, p. 73

Kingussie (Inverness-shire).—*Grantamin Sanatorium.* Res. Med. Supt., Felix Savy, M.D., J.P. Kingussie, ½ mile.

See also *Advt.*, p. 94

Kirkcaldy.—*Sanatorium for Tuberculosis.* Med. Supt., Dr. G. W. McIntosh. Sec., The Town Clerk. Kirkcaldy, 1 mile.

Leeds.—*Gateforth Sanatorium*, near Selby. Res. Med. Supt., Dr. A. C. Meek. *Leeds Sanatorium for Consumptives*, Killingbeck; and *Children's Sanatorium*, "The Hollies," Westwood, Leeds.

Liverpool.—*Broadgreen Sanatorium*, Edge Lane Drive, Liverpool, 13. Res. Med. Supt., Dr. O. F. Thomas. Broadgreen station, ½ mile.

Fazakerley Sanatorium, Longmoor Lane, Liverpool. Res. Med. Supt., C. Rundle, O.B.E., M.D. Fazakerley station, ½ mile.

Liverpool Sanatorium for Consumptives, Delamere Forest, Frodsham. Sec., W. H. Rayner, Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., Alfred Anams, M.D., D.P.H. Frodsham or Helsby, L.M. & S.R., 3½ miles.

Llanybyther (Carmarthenshire).—*West Wales Sanatorium.* The Welsh National Memorial to King Edward VII. Res. Med. Supt., Dr. Henry A. Ross. Llanybyther station, 3 miles.

London.—*City of London Hospital for Diseases of the Heart and Lungs*, Victoria Park, E.2. Apply, Secretary.

Royal Chest Hospital, 231, City Road, E.C.1 (Section of the Royal Northern Group of Hospitals). Res. Phys., Dr. I. O. Thorburn. Apply, Secretary.

Manchester.—*Manchester Hospital for Consumption and Diseases of Throat and Chest*, Hardman Street, Deansgate, Manchester (Out-patients). Sec., W. Hunt. *St. Anne's Home*, Bowdon, Cheshire (In-patients). Res. Med. Off., Dr. M. Lessnoff. *Crossley Sanatorium*, Delamere, Cheshire. Res. Med. Off., Dr. G. Heathcote. (For poor and working classes, after personal examination at Manchester.)

Market Drayton (Shropshire).—*Cheshire Joint Sanatorium.* Res. Med. Supt., Dr. Peter W. Edwards. Market Drayton, 4½ miles.

Marple (Cheshire).—*Nab Top Sanatorium*, for residents of Salford only. Res. Med. Supt., H. M. Fleming, M.D. Rosehill (Marple) station, ½ mile.

Maryburgh (Ross-shire).—*Seaforth Sanatorium.* Med. Off., Dr. W. McLean.

Menai Bridge, Anglesey.—*Penhesgyn-y-Gors Sanatorium for Children* (King Edward VII Welsh National Memorial Association). Med. Off., Dr. H. Grey-Edwards. Matron, Miss Williams. Menai Bridge, 3 miles.

Mendip Hills.—*Nordrach-upon-Mendip*, Blagdon, near Bristol. Res. Med. Supt., Gordon Tippet, M.B., M.R.C.S., L.R.C.P.

See also *Advt.*, p. 82

Midhurst (Sussex).—*King Edward VII Sanatorium.* Res. Med. Off., F. I. M. Jupe, M.A., L.S.A. Midhurst, 4 miles.

Milford (Surrey).—*Surrey County Sanatorium.* Res. Med. Supt., Dr. R. J. Allison. Milford station, S.R., $\frac{1}{2}$ mile.

Montana-sur-Sierre (Switzerland).—*Montana Hall (The British Sanatorium).* Res. Med. Supt., Hilary Roche, M.D., M.R.C.P. See also *Advt.*, p. 93

Murtle (Aberdeenshire).—*Tor-na-Dee Sanatorium.* Res. Med. Supt., Dr. J. M. Johnston. Murtle, $\frac{1}{2}$ mile.

See also *Advt.*, p. 94

Nayland (Suffolk).—*East Anglian Sanatorium* for private patients, *Mallings Farm Sanatorium* for poorer men and women patients, and *East Anglian Children's Sanatorium*, Nayland. Med. Supt., Dr. Jane Walker, C.H., J.P., LL.D. Bures station, L. & N.E.R., $3\frac{1}{2}$ miles; Colchester, 8 miles.

See also *Advt.*, p. 90

New Cumnock (Ayrshire).—*Ayrshire Sanatorium*, Glenafton. Res. Med. Supt., E. E. Prest, M.D. New Cumnock, 3 miles.

Norfolk.—*The Children's Sanatorium, Incorporated*, near Holt. Vis. Med. Off., Dr. H. F. Skrimshire. Hon. Sec., Mrs. C. Munro, Carnegie House, 117, Piccadilly, W.1.

Kelling Sanatorium, Holt. Res. Med. Supt., Dr. J. I. W. Morris. Holt, $1\frac{1}{2}$ miles.

Mundesley Sanatorium, Mundesley. Res. Med. Supts., S. Vere Pearson, M.D., Andrew J. Morland, M.D., and E. C. Wynne-Edwards, M.B. Mundesley, 1 mile.

See also *Advt.*, p. 91

Northampton.—*Creation Sanatorium*, Creation. Res. Med. Supt., E. T. W. Starkie, M.A., B.Ch., M.R.C.S., L.R.C.P. Brixworth, L.M. & S.R., 3 miles.

Nottinghamshire.—*Ransom Sanatorium* (Notts County Council), Rainworth, near Mansfield. Res. Med. Supt., Dr. C. L. Crawford Crowe. Mansfield, 3 miles.

Oban (Scotland).—*Argyll County Sanatorium*, Benvoulin. 40 beds. Vis. Med. Off., Duncan MacDonald, M.D. Oban, 1 mile.

Oldham.—*Strinesdale Sanatorium*. Med. Supt., Dr. J. B. Wilkinson. Oldham, 2 miles.

Oulton Broad (Suffolk).—*Normanston Hospital*. Res. Med. Supt., Dr. H. R. V. Crossfield.

Pau (Basses-Pyrenees), France.—*Trespoey*. Clinic for Pulmonary Diseases. Med. Director, Dr. W. Jullien.

See also *Advt.*, p. 95

Peebles.—*Manor Valley Sanatorium*. Med. Off., C. B. Gunn, M.D. Peebles, 4 miles; Lyne, $1\frac{1}{2}$ miles.

Penmaenmawr (N. Wales).—*Pendyffryn Hall Sanatorium*. Res. Phys., Dennison Pickering, M.D. (Camb.), and V. C. Benson, M.R.C.S., L.R.C.P. Penmaenmawr, L.M. & S.R., $1\frac{1}{2}$ miles. See also *Advt.*, p. 91

Peppard Common (Oxon).—*Berks and Bucks Joint Sanatorium*. Res. Med. Off., Dr. Esther Carling. Reading, $6\frac{1}{2}$ miles.

Ringwood (Hants).—*Linford Sanatorium*. Res. Med. Supts., A. de W. Snowden, M.D. and Dr. A. G. E. Wilcock. Ringwood, 3 miles.

See also *Advt.*, p. 90

Robertsbridge (Sussex).—*Darrell Hall Sanatorium* (East Sussex County Council). Res. Med. Off., Dr. J. R. Dingley. Robertsbridge, S. Rly., $\frac{1}{2}$ mile.

Rudgwick (Sussex).—*Rudgwick Sanatorium*. Vis. London Phys., Dr. Annie McCall. Rudgwick station, 7 minutes.

Ruthin (N. Wales).—*Vale of Clwyd Sanatorium*, Llanbedr Hall. Res. Med. Supt., H. Morrison Davies, M.D. Ruthin station, 2 miles. See also *Advt.*, p. 92

St. Leonards.—*Eversfield Chest Hospital*, West Hill. Res. Phys., Dr. E. J. Maxwell. West St. Leonards, S.R.; West Marina, S.R., within 5 minutes' walk.

Sandon, near Chelmsford (Essex).—*Merivale Sanatorium*. Res. Med. Supt., H. N. Marrett, M.R.C.S., L.R.C.P. Chelmsford station, L. & N.E.R., $3\frac{1}{2}$ miles.

Sandy (Beds).—*The Bedfordshire County Sanatorium*, Mogerhanger Park. Med. Supt., C. G. Welch, M.D. Sandy station, $2\frac{1}{2}$ miles.

Sheffield.—*The City Sanatoria*. Crimicar Lane Sanatorium (males); Commonside Sanatorium (females); Winter Street Sanatorium (both sexes); Nether Edge Sanatorium (both sexes and children). Clinical Tuberculosis Off., H. Midgley Turner, M.D., D.P.H. Sheffield, L.M. & S.R., $4\frac{1}{2}$ miles.

Shirlett, near Broseley (Shropshire).—*King Edward VII Memorial Sanatorium*. Res. Med. Supt., Dr. F. T. Turner. Much Wenlock station, 3 miles.

Skipton (Yorks).—*Eastby Sanatorium for Boys*. Res. Med. Supt., Dr. Catherine Arnott. Embsay station, 2 miles.

South Mimms, Barnet (Middlesex).—*Clare Hall County Sanatorium*. Res. Med. Supt., A. C. Tabois, M.D. Potter's Bar station, 2 miles. Sec., The Clerk, Guildhall, Westminster, S.W.1.

Stannington (Northumberland).—*Children's Sanatorium*. Res. Med. Supt., Dr. Elsie F. Farquharson, M.A. Matron, Miss I. Campbell. Stannington station, 2 miles.

Stonehouse (Glos).—*Standish House Sanatorium*. Res. Med. Supt., W. A. Dickson, M.D., F.R.C.S. Stonehouse, G.W.R., $1\frac{1}{2}$ miles; L.M. & S.R., $2\frac{1}{2}$ miles.

Stourbridge (Worcs).—*Prewood Sanatorium*. Med. Supt., Dr. J. Stevenson, M.C. Stourbridge, 3 miles.

Swansea.—*Adelina Patti Tuberculosis Hospital*, "Craig-y-nos," Pen-y-cae. Res. Med. Supt., Dr. L. R. Clark. Craig-y-nos, 2 miles.

Threlkeld (Cumberland).—*Blencathra Sanatorium.* Res. Med. Supt., Dr. W. Goodchild. Threlkeld, L.M. & S.R., 2 miles. See also *Advt.*, p. 94

Torquay.—“*Whitecliff*” *Tuberculosis Hospital.* Med. Supt., Dr. R. H. Robinson. Torre station, 2 miles.

Ulverston.—*High Carley Sanatorium* (including *Oubas House Children's Sanatorium*). Res. Med. Supt., G. Leggat, M.B., Ch.B., D.P.H. Ulverston, 2 miles.

Vence (A.-M.), France.—*Chateau des Fleurs.* All forms of pulmonary affections. Res. Physician, Dr. Giraud. Nice, 18 miles. See also *Advt.*, p. 88

Ware (Herts).—*Hertfordshire County Sanatorium*, Ware Park. Res. Med. Supt., Herbert Sharpe, M.R.C.S., L.R.C.P. Ware, 2 miles; Hertford, 2 miles.

Warrenpoint (Co. Down).—*Rostrevor Sanatorium.* Phys., Dr. J. A. O'Tierney. Apply Secretary.

Whiteabbey (Co. Antrim).—*Belfast Municipal Sanatorium.* Res. Med. Supt., P. S. Walker, M.D., B.Ch., B.Sc., D.P.H.

Wicklow.—*The Royal National Hospital for Consumption for Ireland*, Newcastle, Wicklow. Res. Med. Off., C. Denys Hanan, M.D. G.S. Rlys. to Newcastle, Co. Wicklow, 3 miles.

Winsley, near Bath.—*Winsley Sanatorium.* Res. Med. Off., Dr. J. D. Macfie. Limpley Stoke station, 1 mile.

Woburn Sands (Beds.)—*Daneswood Sanatorium.* For indigent Jewish patients. Med. Off., Dr. W. A. Barnes. Hon. Sec., Miss Schlesinger, 24, Queen's Court, Queen's Road, W.2.

Worcester (near).—*King Edward VII Memorial Sanatorium*, Knightwick. Free to County patients. Res. Med. Supt., Dr. H. Gordon-Smith. Knightwick, 1½ miles.

HYDROPATHIC ESTABLISHMENTS.

Bournemouth (Hampshire).—*Bournemouth Hydrophatic.* Res. Med. Supt., W. J. Smyth, M.D. Bournemouth West station, ¼ mile. See also *Advt.*, p. 102

Durley Dean Hydro, Bournemouth. Proprietor, C. K. Harper. Bournemouth West, 1 mile.

Linden Hall Hydro, Bournemouth. Proprietors, The Exton Hotels Co. Ltd.

Bristol.—*The Bristol Hydrophatic and Electrotherapeutic Establishment*, College Green. Res. Phys., A. T. Spoor, M.A., M.R.C.S., L.R.C.P. Res. Med. Supt., W. J. Spoor, M.B., M.R.C.S.

Cork.—*St. Ann's Hill Hydrophatic*, St. Ann's Hill, near Blarney, Co. Cork. Res. Phys., Dr. R. H. Barter. Blarney North, 3 miles; Blarney South, ¼ mile.

Crieff.—*Strathearn Hydro* (17 miles from Perth). Res. Med. Supt., T. Gordon Melkie, M.B., C.M. Crieff station, 1 mile.

Forres.—*Cluny Hill Hydrophatic.* Vis. Phys., Dr. John C. Adam. Forres, 1 mile.

Harrogate (Yorkshire).—*Harlow Manor Hydro.* Manageress, Mrs. Baxter. Harrogate station, 1 mile.

The Cairn Hydro, Harrogate. Apply Manager. Harrogate station, ½ mile.

The Harrogate Hydrophatic Lim. Med. Supt., Dr. A. Hinsley-Walker. Man., W. Taylor. Harrogate station, ½ mile.

Ilkley (Yorkshire).—*Craiglands Hydro.* Res. Phys., Maurice R. Dobson, O.B.E., M.B., B.S. (Lond.), L.R.C.P., M.R.C.S. (Eng.). See also *Advt.*, p. 102

Leicester.—*Leicester Hydro Establishment*, Museum Square, Leicester. See also *Advt.*, p. 102

Limpley Stoke (near Bath).—*West of England Hydrophatic.* Vis. Med. Supt., Dr. C. N. Vaisey. Apply, the Secretary.

Matlock.—*Rockside Hydrophatic*, Matlock. Res. Phys., Dr. C. R. L'Estrange Orme and Dr. N. C. Selater. Matlock, L.M.S., ½ mile.

Smedley's Hydrophatic, Matlock. Res. and Vis. Physicians. Matlock station, ½ mile; omnibus. See also *Advt.*, p. 101

Peebles.—*Peebles Hotel Hydrophatic.* L.M.S. and L. & N.E.R. stations.

Southport (Birkdale Park).—*Smedley Hydrophatic.* Southport or Birkdale stations, 5 minutes.

Kenworthy's Hydrophatic, Southport. Res. Phys., Dr. I. E. Kenworthy. Chapel Street or Lord Street stations.

West Kirby (Cheshire).—*Hoylelake Hotel* (Late *West Kirby Hydro Hotel*). Telephone: Hoylelake 86, Kirby Park station, 5 minutes. Apply Manageress.

See also *Advt.*, p. 104

NURSING ASSOCIATIONS AND INSTITUTIONS FOR NURSES.

London.—*Carendish Temperance Male Nurses' Corporation Lim.*, 54, Beaumont St., W.1; 23, Upper Baggot St., Dublin; 28, Windsor Terr., Glasgow; and 176, Oxford Rd., Manchester.

See also Advt., p. 82

Male Nurses' Association, 29, York Street, Baker Street, W.1. Sec., W. J. Hicks.

See also Advt., p. 81

New Mental Nurses' Co-operation, 139, Edgware Road, W.2. Lady Supt., Miss Eva R. Crook.

See also Advt., p. 79

The Nurses' Association, 29 York Street, Baker Street, W.1. Sec., W. J. Hicks; Supt., Mrs. Millicent Hicks.

See also Advt., p. 81

The Temperance Male and Female Trained Nurses' Co-operation, 45, Beaumont Street, W.1. Sec., H. S. Sturgess.

See also Advt., p. 80

York.—*The Retreat, Trained Nurses' Department*. Apply to the Matron.

See also Advt., p. 80

PRIVATE HOMES FOR INVALIDS, MATERNITY HOMES, AND INSTITUTIONS FOR SPECIAL CARE AND TREATMENT.

Alderley Edge (Cheshire).—*The David Lewis Colony* (for sane epileptics), and *Colthurst House School* (for epileptic boys and girls). Res. Director, Richard Hamley, M.B., D.P.M. Alderley Edge, 3 miles.

See also Advt., p. 84

Ascot.—*Farmwood*, Sunninghill. For convalescent and rest cases. Apply to the Secretary.

See also Advt., p. 85

Bath.—*Lansdown Hospital and Nursing Home*, Bath. For gout, rheumatism, and physical infirmities. Phys., Dr. Wells-Beville. L.M. & S. or G.W. stations, 1 mile.

See also Advt., p. 79

Bristol.—*Dorset House*, Clifton Down. Functional nervous disorders—ladies and girls. Apply, Elizabeth Casson, M.D., D.P.M.

See also Advt., p. xlv

Conway, North Wales.—*The Dr. Garrett Memorial Home for Convalescent Children*, Morfa Drive. For boys and girls. 200 beds (86 open-air). Proprietress, Mrs. C. E. M. Garrett. Conway, L.M. & S.R., $\frac{3}{4}$ mile.

See also Advt., p. 78

Garches, near Paris.—*Clinique Médicale du Château de Garches*. Nervous disorders, nutrition, etc. Director, Dr. Garand.

See also Advt., p. III

Harrow-on-the-Hill.—*Bowden House* (for functional nervous disorders). Med. Supt., Henry L. Wilson, M.D., M.R.C.P. Sudbury Hill, Harrow, L. & N.E.R., 15 mins. walk.

See also Advt., p. 86

Hatch End (Middlesex).—*Oxhey Grove Ltd.*, Oxhey Grove, Hatch End. For early mental conditions in both sexes. Res. Phys., Dr. Margherita M. Lilley. Hatch End (L.M. & S.R. & Bakerloo), 1 mile.

See also Advt., p. 86

King's Langley (Herts).—*The Archer Nerve Training Colony, Langley Rise, Ltd.* (for functional nervous disorders). Vis. Physicians. Apply, Secretary. King's Langley (L.M. & S.R.), 1 mile.

See also Advt., p. 86

Liverpool.—*Home for Epileptics*, Maghull (for sane epileptics), and *Chilton Home*,

certified as a special school for 82 epileptic children. Med. Officer, C. V. H. Nesbit, M.D. Sec., C. E. Grisewood, A.C.A., 20, Exchange Street East, Liverpool, 2.

See also Advt., p. 80

London.—*Caerthillian Maternity Home*, 85 and 87, Fordwyche Road, Cricklewood, N.W.2. Matron, Miss K. Wyatt.

See also Advt., p. 85

Institute of Ray-Therapy and Electro-Therapy, 152-154, Camden Road, N.W.1. Hon. Med. Director, William Beaumont, M.R.C.S., L.R.C.P. Hon. Sec., Winifred Beaton, M.A.

See also Advt., p. 82

Swedish Institute and Clinic, 108, Cromwell Road, S.W.7. For Massage, Medical Electricity, and Medical Gymnastics. Gloucester Road (Dist., Met. and Piccadilly Tube), 2 minutes. 'Phone, West 1010.

See also Advt., p. 82

Woodside Hospital, Woodside Avenue, Muswell Hill, N. 10. (St. Luke's Foundation.) For functional nervous disorders. Physician in charge, R. W. Gilmour, M.R.C.P.

See also Advt., p. 85

Nice.—"La Colline," Saint-Antoine-Nice, France. Disorders of digestion, nerves, etc. Director, Dr. Perski.

See also Advt., p. III

Perth.—*Gilgal Hospital*. For neuro-pathic and psychopathic disorders. Phys. Supt., W. D. Chambers, M.A., M.D.

See also Advt., p. 86

Ruthin, North Wales.—*Ruthin Castle*. Private Hospital for Internal Diseases. Senior Physician, E. I. Spriggs, M.D., F.R.C.P. Ruthin, $\frac{1}{2}$ mile.

See also Advt., p. II

Torquay.—*Ockenden Convalescent Home*, Warren Road. Hon. Med. Off., Eric Catford, M.R.C.S., L.R.C.P. Lady Supt., Miss Glover. Torre and Torquay stations, 1 mile.

See also Advt., p. III

Val-Mont, Switzerland.—*Val-Mont Medical Clinic*, Glion, above Montreux. Disorders of nutrition, diabetes, etc. Chief Med. Director, Dr. A. Widmer.

See also Advt., p. 98

PRINCIPAL BRITISH SPAS.

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

THE BRITISH SPAS FEDERATION.

Bath (Somerset).—Sheltered from N. and N.E. winds by hills from 600 to 800 feet high; 107 miles from London. Average rainfall 31 inches. Climate mild and equable.

Waters.—The springs are hyperthermal (120°), radio-active, diuretic.

Therapeutic Indications.—Gout, arthritis, spondylitis, fibrositis, nervous debility, toxic neuritis, certain heart conditions, constipation and colitis, various skin diseases, chronic forms of rhinitis, pharyngitis and laryngitis, obesity, gravel, and hepatic dysfunction.

Baths.—A thoroughly equipped bathing establishment: including deep baths (500 gallons of natural hot radio-active water), undercurrent douching, douche massage in many forms, and intestinal lavage (Plombières douches), throat sprays and inhalation of the natural radium emanation, and the Bath thermal vapour treatment; also electrotherapy.

Hotel.—The Pulteney Hotel (see p. 100).

Nursing and Baths.—Lansdown Hospital and Nursing Home (see p. 79).

Bridge of Allan (Stirlingshire).—422 miles from London. Sheltered from N. and N.E. winds by the Ochil Hills. Average rainfall 37 inches. Climate mild and equable.

Waters.—Natural saline mineral springs.

Therapeutic Indications.—Rheumatism, gout, sciatica, many chest diseases, chronic affections of the liver, stomach, and bowels, and some diseases of the skin.

Baths.—Excellent suite of baths and electro-therapeutic apparatus.

Buxton (Derbyshire).—1000 to 1200 feet above sea level; 163 miles from London 23 miles from Manchester. Sheltered from north and east winds. Very bracing air.

Waters.—Simple, highly radio-active, natural temperature 82° F., mainly bicarbonate of calcium and magnesium ingredients. Tasteless, odourless; also chalybeate springs.

Therapeutic Indications.—Gout, rheumatism, rheumatoid arthritis, sciatica, and various nervous diseases, neurasthenia, disorders of digestion, and skin diseases, malaria, mucomembranous colitis, arteriosclerosis, phlebitis, diseases of the throat and air-passages; anæmic conditions, and convalescence from prolonged illness.

Baths.—Establishments, including St. Ann's Well (Pump Room), recently modernized.

Cheltenham (Gloucestershire).—184 feet above sea level; 101 miles from London. Climate soft and mild. Average rainfall 27 inches. Sunshine 1486 hours.

Waters.—Three springs: the Fieldholme or twin saline, containing nearly equal parts of magnesium sulphate and sodium sulphate; the Lansdown or sodium sulphate saline, the chief ingredients of which are sulphate and chloride of sodium; and the Pittville or alkaline saline.

Therapeutic Indications.—The toxic and congestive states associated with liver and stomach disorders, constipation, obesity, glycosuria, and gout.

Baths.—Including douche and massage.

Droitwich Spa (Worcestershire).—150 feet above sea level; 2½ hours by express train from London (Paddington), 19 miles from Birmingham, 7 from Worcester. Rainfall 25 inches. Mean maximum temperature 57° F., mean minimum temperature 43° F.

Waters.—The most powerful saline in the world. The brine is pumped from the triassic formation 200 feet below the ground level at a temperature of about 45° F., and is heated by introducing steam.

Therapeutic Indications.—Chronic muscular and articular rheumatism, arthritis, chronic articular or irregular gout, neuritis, sciatica, neuralgia, some heart disorders, sprains and injuries of tendons, muscles, joints, etc.

Baths.—Reclining, douche, needle, vapour, swimming, Aix-douche, Nauheim baths, brine-pine or Homburg baths, etc.

Hotel.—Raven and Park Hotels (see p. 98); Worcestershire Brine Baths Hotel (see p. 101).

Boarding Establishment.—Ayrshire House (see p. 103).

Harrgate (Yorkshire).—450–600 feet above sea level, 203 miles from London. The climate is stimulating and fairly dry—bracing moorland air. Average rainfall 30 inches. Mean temperature 47° F.

Waters.—Celebrated for the medicinal properties of its different mineral waters—sulphurous, chalybeate, alkaline, and saline.

Therapeutic Indications.—Gout and other metabolic disorders, functional liver derangement and early cases of cirrhosis, cholelithiasis and cholecystitis, chronic skin diseases, neuritis and arthritis, mucous colitis, chronic dysentery, constipation, and intestinal toxæmias, æmia, nervous diseases, hyperpiesis, and the sequelæ of tropical diseases.

Baths.—In the bathing establishments all the latest treatments are given.

Mineral Water.—'Aquaperia' aperient mineral water is bottled at Harrogate by Camwal Ltd. from their own Spring (see p. 171).

Leamington Spa (Warwickshire).—195 feet above sea level; 88 miles from London. Equable and mild climate. Average rainfall 25 inches. Mean annual temperature 49°. Westerly winds prevail.

Waters.—Hypertonic saline water; aperient and diuretic.

Therapeutic Indications.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia, and neuritis, diseases arising from a plethoric condition of the chylipoietic viscera, conditions of increased vascular tension, and chronic interstitial nephritis.

Baths.—Turkish, massage douches, saline, Plombières, paraffin wax, Berthollet, electric, and swimming. (See also p. 97).

Llandrindod Wells (Radnorshire).—750 feet above sea level. Climate exceedingly bracing, but sheltered from east winds, and with an average rainfall of about 40 inches. About 170 miles distant from London.

Waters.—Saline, sulphur and radium-sulphur, magnesium, lithia saline, and chalybeate. Slightly aperient and strongly diuretic.

Therapeutic Indications.—Digestive disorders, gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus or any kidney or bladder condition requiring diuresis, and in neurasthenia.

Baths.—Sulphur, immersion, needle, and douche; Aix and Vichy douche and massage; Scotch douche; Nauheim; medicated baths; fango and peat baths; whirlpool and agitation baths; and most electrical treatments.

Strathpeffer Spa (Ross-shire, N.B.).—150 to 300 feet above sea level. Sheltered practically on all sides, except the N.E. Prevailing wind S.W. Bracing air. Average rainfall 31 inches. Mean annual temperature 45° F.

Waters.—Sulphurous and chalybeate. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

Therapeutic Indications.—Chronic gout and rheumatism, rheumatoid arthritis, chronic skin diseases, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, and neurasthenia.

Baths.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, Plombières, radiant heat (electric), and high-frequency current.

Trefriw Wells (Carnarvonshire).—5 hours from London. The climate is bracing, the air soft, pure, and mostly of a westerly or south-westerly type. The pump-room and baths are open all the year, but the principal season is March to the end of October.

Waters.—Two varieties: (1) The stronger sulpho-chalybeate, and (2) the milder sulpho-chalybeate. Used internally, and externally in the form of baths.

Therapeutic Indications.—Curable forms of anæmia, nervous, debilitating and wasting diseases, rheumatism, sciatica, gout, and neuritis.

OTHER BRITISH SPAS.

Church Stretton (Salop).—613 feet above sea level. 153 miles from London. Pure bracing air, and a generally invigorating climate. Prevailing wind, S.W. Average rainfall 33 inches. Mean temperature 44°.

Waters.—Said to be the purest in Great Britain.

Therapeutic Indications.—Specially the 'open-air' cure of neurasthenia, for sequelæ of influenza, for insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from overwork, and convalescence after illness or operation.

Ilkley (Yorkshire).—Situated on the southern slope of the valley of the Wharfe, 211 miles from London, 18 miles from Harrogate. Occupying a sheltered position. Average rainfall 39 inches. Mean annual temperature 47° F. Bracing and invigorating moorland air.

Waters.—The water-supply obtained from springs is remarkably pure, bright, and sparkling. Chalybeate waters. Saline.

Therapeutic Indications.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydro-therapeutic.

Baths.—Complete suites of baths are to be found in the numerous establishments. Electrical, Weir-Mitchell.

Hydropathic Establishment.—Craiglands Hydropathic (see p. 102).

Llangammarch Wells (Breconshire).—600 feet above sea level. 213 miles from London. Well protected from the east, and prevailing wind is S.W.

Water.—Saline, containing the chlorides of barium (6½ grains per gallon), calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles.

Therapeutic Indications.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

Malvern (Worcestershire).—520 feet above sea level. A health centre of long repute, 122 miles from London. Air dry and bracing. Prevailing winds S.W. and W. Average rainfall 30 inches. Mean temperature about 49° F. Exceptional sunshine records.

Waters.—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon, with high eliminative qualities. The water is dispensed in a new Pump Room adjoining the Winter Gardens and Priory Park.

Therapeutic Indications.—Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic, and cutaneous diseases. (See also p. 100.)

Matlock (Derbyshire).—144 miles from London. South-west aspect—well sheltered from the north and east. Climate free from extremes of heat and cold. The water pure and soft. Season all the year. The Matlock system of hydropathic treatment is carried out in all its branches. The principal Hydros are installed with latest electric baths and appliances.

Therapeutic Indications.—Gout, rheumatism, arthritis, neuritis, sciatica, lumbago, neurasthenia, colitis, cholecystitis, cardiac and renal diseases.

Hydropathic Establishment.—Smedley's Hydropathic (see p. 101).

At **Matlock Bath** there are thermal mineral springs of long-established repute, rising at 68° F.

Peebles (Peeblesshire, N.B.).—About 500–600 feet above sea level. One hour from Edinburgh and 382 miles from London. Average rainfall, about 38 inches. Bracing climate, but sheltered from the north winds.

Waters.—The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well (6 miles east).

Therapeutic Indications.—The waters are specially suited to the Nauheim and Bourbon Lancy treatment of cardiac disease, dyspepsia, gout, rheumatism, and neurasthenia.

Torquay (Devonshire).—199½ miles from London. Non-stop express trains run daily, the journey occupying only 3½ hours. There are through carriages from Northern and Midland cities. The most beautifully situated marine health resort in the British Isles. Well sheltered from the north. The sunshine record is one of the highest in the country. Average rainfall, 35.5 inches. Mean temperature, 51.9°. Sunshine record averages 1742.9 hours. Ultra-violet rays 1932, 2.83 units daily mean.

Climate.—Mild, soft, and equable. It is specially beneficial for many pulmonary, bronchial, and laryngeal conditions, for mild cases of nephritis, for delicate children, and for aged and debilitated persons. Those unable to withstand the rigour of the winter in other British health resorts derive great benefit from residence in Torquay. The season is all the year round.

Baths.—The Marine Spa baths are very modern and complete. They are ideally situated. The recognized forms of spa treatment are available, and fully certificated assistants are retained upon the staff for electrical and other treatments. A medical consultation room is available for the convenience of medical practitioners and patients. There is a large warm sea-water swimming bath with modern filtration plant. Salt-water baths, concentrated brine baths, seaweed baths, and Dartmoor peat packs are a speciality, and are indicated in the treatment of muscular rheumatism, fibrositis, sciatica, rheumatoid arthritis, osteo-arthritis and gout. (See also p. 111.)

Tunbridge Wells (Kent).—400 feet above sea level, 34 miles from London. Climate is tonic and invigorating. Prevailing winds W. and S.W. Average rainfall, about 30 inches. Mean temperature, 49°.

Waters.—A weak, non-aerated, chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

Therapeutic Indications.—Waters indicated in anæmia, chlorosis, and allied conditions.

Woodhall Spa (Lincolnshire).—50 feet above sea level. 124 miles from London. Average rainfall 24 inches. Mean annual temperature 48°.

Waters.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

Therapeutic Indications.—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases peculiar to women; diseases of throat and nose; liver disorders.

Spa Baths.—These include immersion, shower, undercurrent, and local douches; Aix and Vichy douche massage; Nauheim, electric, and Schnee baths; Dowsing radiant heat and light baths.

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 Tuberculosis Association—Hon. Sec., G. T. Herbert, St. Thomas's Hospital, S.E.1.
 Wellcome Historical Medical Museum—Wellcome Research Institution, 173-193, Euston Road, N.W.1.
 West Kent Medico-Chirurgical Society—Hon. Sec., Dr. C. J. B. Buchan, "Ledard", 267, Baring Road, S.E.12.
 West London Medico-Chirurgical Society—West London Hospital, Hammersmith, W.6.

MEDICAL AND SCIENTIFIC PERIODICALS, ETC.

- Anæsthesia, British Journal of—Quarterly, 10/6—34, Cross Street, Manchester.
 Analyst—Monthly, 3/-: 30/- per annum—W. Heffer & Sons Lim., Cambridge.
 Anatomy, Journal of—Quarterly, 40/- per annum—Cambridge University Press, Fetter Lane, E.C.4.
 Annals of Applied Biology—Occasionally, 12/-—Cambridge University Press, Fetter Lane, E.C.4.
 Annals of Internal Medicine—Monthly, 40/- per annum—8, Henrietta Street, W.C.2.
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 Archives of Medical Hydrology—Thrice yearly, at 4/- each—109, Kingsway, W.C.2.
 Ars Medici—Monthly, 16/- per annum—8, Henrietta Street, W.C.2.
 Bacteriology, Journal of—Monthly 5/-, or 55/- per vol.—8, Henrietta Street, W.C.2.
 Better Health—Monthly, 2/6 per annum—36-38, Whitefriars Street, E.C.4.
 Biochemical Journal—Occasionally, 70/- per volume—Cambridge University Press, Fetter Lane, E.C.4.
 Biological Chemistry, Journal of—Monthly, 27/6 per volume—8, Henrietta St., W.C.2.
 Biology, Quarterly Review of—27/6 per annum—8, Henrietta Street, W.C.2.
 Birmingham Medical Review—Quarterly, 3/-: 12/- per annum.—The Birmingham Medical Institute, 154, Great Charles St., Birmingham. (*See Advertisement, p. 54.*)
 Brain—Quarterly 6/-: 24/- per annum—Macmillan, St. Martin's Street, W.C.2.
 Bristol Medico-Chirurgical Journal—Quarterly 3/-: 10/6 per annum—J. W. Arrow-smith Ltd., Bristol. (*See Advertisement, p. 52.*)
 British Food Journal and Hygienic Review—Monthly 9d.; 10/6 per annum—22, Northumberland Avenue, W.C.2.
 British Health Resorts Association, Official Handbook—Occasionally, 1/-—40 Gloucester Place, Portman Square, W.1.
 British Journal of Experimental Pathology—Six times per annum for 40/-—Lewis, 136, Gower Street, W.C.1.
 British Journal of Physical Medicine—Monthly, 21/- per annum—17, Featherstone Buildings, W.C.1. (*See Advertisement, p. 26.*)
 British Medical Journal—Weekly 1/3—B.M.A. House, Tavistock Square, W.C.1.

- Caledonian Medical Journal—Quarterly 1/6—70, Mitchell Street, Glasgow, C.1.
 Cancer, Journal of—Quarterly 2/6; 10/6 per annum—Crow Street, Dublin.
 Charing Cross Hospital Gazette—Quarterly, 2/6 per annum—Charing Cross Hospital, Chandos Street, W.C.2.
 Childhood, Archives of Disease in—Six times a year, 25/- per annum—British Medical Association, B.M.A. House, Tavistock Square, W.C.1.
 Children's Diseases, British Journal of—Quarterly 7/6; 25/- per annum—Adlard & Son Lim., 21, Hart Street, W.C.1.
 Clinical Journal—Monthly 2/6; 25/- per annum—Lewis, 136, Gower Street, W.C.1. (*See Advertisement, p. 36.*)
 Clinical Science (incorporating *Heart*)—Occasionally—37/6 per vol.—Shaw & Sons Lim., 7, Fetter Lane, E.C.4.
 Dental Journal, British—1st and 15th, 1/-; 25/- per annum—23, Russell Square, W.C.1.
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 Dental Science and Prosthetics, British Journal of—Monthly 1/-; 10/- per annum—Bale, 83-91, Great Titchfield Street, W.1.
 Dentistry, Preventive—Monthly 1/-—Bale, 83-91, Great Titchfield Street, W.1.
 Dentists' Register—Yearly 12/-—Constable, 10, Orange Street, W.C.2.
 Dermatology and Syphilis, British Journal of—Monthly 4/-; 42/- per annum—H. K. Lewis & Co. Lim., 136, Gower Street, W.C.1.
 East Riding Medical Journal—Monthly 1/-—51, High Street, Hull.
 Edinburgh Medical Journal—Monthly 4/- net; 40/- per annum—Oliver & Boyd, Tweeddale Court, Edinburgh.
 General Practice—Quarterly, 12/- per annum—83-91, Great Titchfield Street, W.1.
 Glasgow Medical Journal—Monthly 3/-; 30/- per annum—70, Mitchell Street, Glasgow.
 Guy's Hospital Gazette—Fortnightly 9d.; 10/- per annum—Ash & Co. Lim., Henry Street, Bermondsey Street, S.E.1.
 Guy's Hospital Reports—Quarterly, 12/6—Guy's Hospital, London, S.E.1.
 Helminthology, Journal of—Quarterly, 25/- vol.—Keppel Street, W.C.1.
 Homeopathic Journal, British—Quarterly 5/-—83-91, Great Titchfield Street, W.1.
 Hospital, The—Monthly 6d.; 7/6 per annum—34, Paternoster Row, E.C.4.
 Hospital Diary, The—Yearly 5/6—G. R. C. Brook & Co., 27, Old Bond Street, W.1. (*See Advertisement, p. 23.*)
 Hospitals Year Book—Yearly 10/- net—Central Bureau of Hospital Information, 12 Grosvenor Crescent, S.W.1. (*See Advertisement, p. 55.*)
 Hygiene, Bulletin of—Monthly 2/6; 21/- per annum—Keppel Street, W.C.1.
 Hygiene, Journal of—Quarterly 14/-—Cambridge University Press, Fetter Lane, E.C.4.
 Inebriety, British Journal of—Quarterly 2/6—Baillière, 8, Henrietta Street, W.C.2.
 Irish Journal of Medical Science (Official Organ of the Royal Academy of Medicine in Ireland)—Monthly 2/6—Parkgate Printing Works, Dublin. (*See Advt., p. 48.*)
 Irish Medical and Hospital World—Monthly, 7/6 per annum—268, North Circular Road, Dublin.
 Journal of Aviation Medicine—Monthly 7/6—8, Henrietta Street, W.C.2.
 Journal of Clinical Pathology—Six times a year for 27/6—8, Henrietta Street, W.C.2.
 Journal of Clinical Research—Quarterly 1/-—Watergate House, York Buildings, Adelphi, W.C.2. (*See Advertisement, p. 1.*)
 Journal of Comparative Psychology—Twice monthly, 5/9—8, Henrietta Street, W.C.2.
 Journal of Experimental Biology—Occasionally, 12/6—133-137, Fetter Lane, E.C.4.
 Journal of Immunology—Twice monthly, 5/9—8, Henrietta Street, W.C.2.
 Journal of Nutrition—Six times yearly, 25/- per annum—8, Henrietta Street, W.C.2.
 Lancet—Weekly, 42/- per annum—7, Adam Street, W.C.2. (*See Advertisement, p. 47.*)
 Laryngology and Otology, Journal of—Monthly 4/-; 40/- per annum—Headley Brothers, 109, Kingsway, W.C.2. (*See Advertisement, p. 22.*)
 Laryngoscope, The—Monthly, 35/- per annum—Baillière, 8, Henrietta Street, W.C.2.
 Liverpool Medico-Chirurgical Journal—Twice yearly, 2/6—Mount Pleasant, Liverpool.
 London Hospital Gazette—Eight times a year, 1/-—London Hospital Club's Union, Turner Street, E.1.
 Magazine of the London (Royal Free Hospital) School of Medicine for Women—Three times yearly, 2/6 per annum—Women's Printing Society, Brick Street, W.1.
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 Maternity and Child Welfare—Monthly 6d.; 5/- per annum—Bale, 83-91, Great Titchfield Street, W.1.
 Medical Annual—Yearly 20/- net (17/- Subscribers)—John Wright & Sons Lim., Bristol.
 Medical Directory—Yearly 36/- net—Churchill, 40, Gloucester Place, W.1. (*See Advertisement, p. 32.*)
 Medical Forum—Monthly 2/-; 21/- per annum—83-91, Great Titchfield Street, W.1.

- Medical Officer—Weekly 1/-; 42/- per annum (and Supplement monthly: The Jennerian)—36-38, Whitefriars Street, E.C.4. (*See Advertisement, p. 53.*)
- Medical Press and Circular—Weekly 6d.; 21/- per annum—8, Henrietta Street, W.C.2. (*See Advertisement, p. 51.*)
- Medical Register—Yearly 21/-—Constable, 10, Orange Street, W.C.2.
- Medical and Dental Students' Register—Yearly 7/6—10, Orange Street, W.C.2.
- Medical Times—Monthly 6d.—8 & 9, St. Alban's Place, Islington, N.1.
- Medical World—Weekly 1/-; 52/- per annum—56, Russell Square, W.C.1.
- Medicine—Quarterly, 27/6 per vol.—8, Henrietta Street, W.C.2.
- Mental Science, Journal of—Quarterly 7/6—40, Gloucester Place, W.1.
- Middlesex Hospital Journal—Six issues, 1/- each—Middlesex Hospital, W.1.
- Midwives' Roll—Yearly 42/-—Spottiswoode, 1, New Street Square, E.C.4.
- National Medical Journal—Quarterly 6d.—National Medical Union, 11, Chandos Street, W.1.
- Neurology and Psychiatry, Review of—30/- per annum—Bristo Place, Edinburgh.
- Neurology and Psychopathology, Journal of—Quarterly 8/6 net; 30/- per annum—British Medical Association, Tavistock Square, W.C.1.
- Newcastle Medical Journal—Quarterly, 2/6—Strawberry House, Newcastle-on-Tyne.
- Obstetric Journal—Quarterly, 2/6—8, St. Peter's Square, Manchester.
- Obstetrics and Gynaecology of the British Empire, Journal of—Six times a year, 52/6—34, Cross Street, Manchester.
- Occupational Therapy and Rehabilitation—Six issues, 27/6—8, Henrietta Street, W.C.2.
- Ophthalmology, British Journal of—Monthly, 5/-; 42/- per annum—Geo. Pulman & Sons Lim., 24, Thayer Street, W.1.
- Parasitology—Quarterly 18/6—Cambridge University Press, Fetter Lane, E.C.4.
- Pathology and Bacteriology, Journal of—Yearly, 60/- per annum—Oliver & Boyd, Edinburgh.
- Pharmacology and Experimental Therapeutics, Journal of—Monthly 7/6—8, Henrietta Street, W.C.2.
- Physiological Abstracts—Monthly, 42/- per vol.—136, Gower Street, W.C.1.
- Physiology (Experimental), Quarterly Journal of—42/- per annum—Chas. Griffin & Co. Lim., 43, Drury Lane, W.C.2.
- Physiology, Journal of—Quarterly, 30/- per volume—Fetter Lane, E.C.4.
- Post-Graduate Medical Journal—Monthly 6d.—1, Wimpole Street, W.1.
- Practitioner—Monthly, 4/-; 42/- per annum—6 & 8, Bouverie St., E.C.4. (*See Advertisement, p. 13.*)
- Prescriber—Monthly, 2/-; 20/- per annum—13, Glencairn Crescent, Edinburgh, W. (*See Advertisement, p. 26.*)
- Psycho-analysis, International Journal of—Quarterly, 30/- vol.—8, Henrietta St., W.C.2.
- Psychology, British Journal of—Quarterly (Medical Section), 30/-; (General Section), 30/- net per volume—Cambridge University Press, Fetter Lane, E.C.4.
- Public Health—Monthly 2/6; 31/6 per annum—1, Upper Montague Street, W.C.1.
- Quarterly Journal of Medicine—Quarterly 10/6; 35/- per annum—Oxford University Press, Amen House, E.C.4.
- Radiology, British Journal of—Monthly 4/-; 42/- per annum—The British Institute of Radiology, 32, Welbeck Street, W.1.
- R.A.M.C., Journal of the—Monthly 2/-—Bale, 83-91, Great Titchfield Street, W.1.
- Royal Naval Medical Service, Journal of the—Quarterly 6/- net; 20/- per annum—83-91, Great Titchfield Street, W.1.
- Royal Sanitary Institute, Journal of the—Monthly 1/-—12, Long Acre, W.C.2.
- Royal Society of Medicine, Proceedings of the—Monthly 7/6 net; 105/- per annum—Longmans, Green & Co. Lim., 39, Paternoster Row, E.C.4.
- St. Bartholomew's Hospital Journal—Monthly 9d.; 7/6 per annum—Students' Union, St. Bartholomew's Hospital, E.C.1.
- St. Bartholomew's Hospital Reports—Yearly 21/-—50A, Albemarle Street, W.1.
- St. George's Hospital Gazette—Monthly 6d.—83-91, Great Titchfield Street, W.1.
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- Serpent, The—Six times a year, 3/6 per annum—University Union, Manchester.
- State Medicine, Journal of—Monthly 2/-—23, Queen Square, W.C.1.
- Surgery, British Journal of—Quarterly 12/6 net; 42/- per annum—John Wright & Sons Lim., Bristol. (*See Advertisement, p. 46.*)
- Surgery, Gynaecology and Obstetrics, and International Abstract of Surgery—Monthly 7/6; 60/- per annum—Baillière, 8, Henrietta Street, W.C.2.
- Transactions of the Royal Society of Tropical Medicine and Hygiene—Six times a year for 35/-—Manson House, 26, Portland Place, W.1.
- Tropical Diseases Bulletin—Monthly 2/6; 21/- per annum—Keppel Street, W.C.1.
- Tropical Medicine and Hygiene, Journal of—Fortnightly 1/6; 30/- per annum—Bale, 83-91, Great Titchfield Street, W.1.

- Tropical Medicine and Parasitology, Annals of—Quarterly 7/6; 22/6 per annum—University Press, 177, Brownlow Hill, Liverpool.
- Tubercle—Monthly 2/6; 27/6 per annum—Bale, 83-91, Great Titchfield Street, W.1.
- Tuberculosis, British Journal of—Quarterly 2/6—Baillière, 8, Henrietta Street, W.C.2. (*See Advertisement, p. 50.*)
- Ulster Medical Journal—Quarterly 5/- per annum—Official Organ of the Ulster Medical Society, the Medical Institute, College Sq. North, Belfast. (*See Advertisement, p. 56.*)
- University College Hospital Magazine—Oct. to March, 6d. each—Bale, 83-91, Great Titchfield Street, W.1.
- Urology, British Journal of—Quarterly, 7/6; 25/- per annum—Constable, 10 & 12, Orange Street, W.C.2. (*See Advertisement, p. 49.*)
- Urology, Journal of—Monthly 3/9—8, Henrietta Street, W.C.2.
- Veneral Diseases, British Journal of—Quarterly, 6/-—10, Orange Street, W.C.2.
- West London Medical Journal—Quarterly 2/-—83-91, Great Titchfield Street, W.1.

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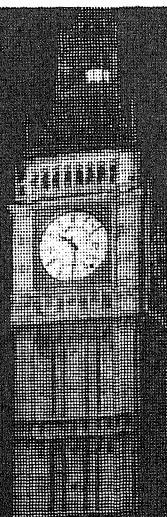
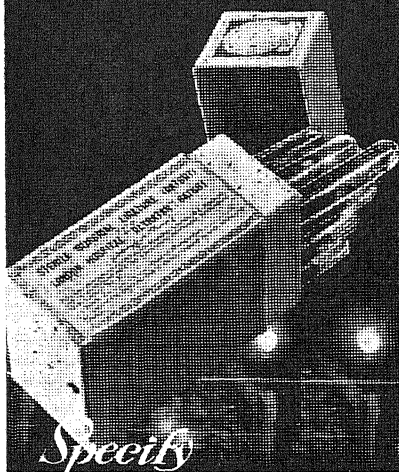
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NOTES.

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1934

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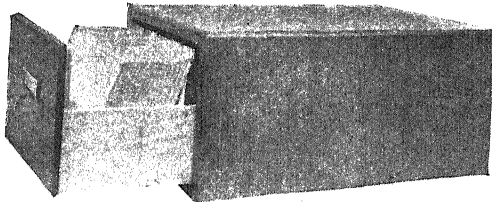
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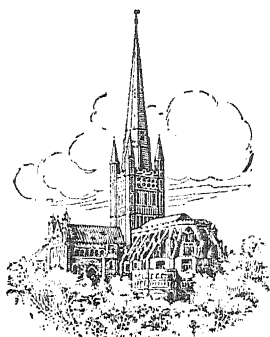
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† Not for the present issuing Policies under with Profit tables.

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Alliance Assurance Co. Ltd., Bartholomew Lane, E.C.2. Gen. Man., A. Levine P	1824	49/1	65/1	90/10	23,451,441
Atlas Assurance Co. Ltd., 92, Cheapside, E.C.2. Gen. Man., C. H. Falloon. Act. and Life Man., William Penman P	1808	48/1	63/7	88/4	9,063,920
Australian Mutual Provident Society, 73-76, King William St., E.C.4. Man. for U.K., A. W. Nicholls, A.I.A. M	1849	48/2	64/5	89/10	86,258,112
Beacon Insurance Co. Ltd., 142, Edmund St., Birmingham, 3. Man. Director, H. J. Greening, London Office, Insurance House, Kingsway, W.C.2 P	1883	43/5	58/6	84/1	3,365,313
Britannic Assurance Co. Ltd., Life, Fire, Accident, and General Insurances, Broad St. Corner, Birmingham. Chairman, Jno A. Jefferson, F.I.A. Sec., J. M. Laing, F.I.A., F.F.A. Further particulars see opposite page P	1866	47/9	64/-	91/1	22,000,000
British Equitable Assurance Co. Ltd., Eastern Entrance, Royal Exchange, E.C.3. Man., Douglas A. Coleman P	1854	46/-	61/10	87/3	1,693,305
British General Insurance Co. Ltd., 66, Cheapside, E.C.2. Man. Dir., Norman M. Walker P	1904	49/5	64/10	90/7	1,033,749
† British Widows' Assurance Co. Ltd., 1, Old St., E.C.1. Joint Gen. Mans., Robert J. Jamieson and F. E. Crabtree P	1902	—	—	—	600,274
Caledonian Insurance Co., 19, George St., Edinburgh. Gen. Man., F. J. Cameron, F.F.A., F.I.A., London (City) Office, 5, Lothbury, E.C.2. Further particulars, see page 5 P	1805	48/5	64/6	90/7	7,225,245
Canada Life Assurance Co., 2, St. James's Square, S.W.1. Man., J. R. Wandless, F.I.A. P	1847	48/5	65/4	94/2	44,607,994
Clerical, Medical, and General Life Assurance Society, 15, St. James's Square, S.W.1, and 8, King William St., E.C.4. Gen. Man., A. D. Besant. P	1824	47/6	65/2	94/10	11,293,075
Colonial Mutual Life Assurance Society Ltd., 4, St. Paul's Churchyard, E.C.4. Man., Ernest A. Cawdron. Sec., J. S. Gillespie M	1873	48/9	65/1	89/10	14,053,967
Commercial Union Assurance Co. Ltd., 24, Cornhill, E.C.3. Act., H. Brown, B.A., F.I.A. P	1861	46/3	63/3	93/2	20,600,869
Confederation Life Association (of Canada), Bush House, Aldwych, W.C.2. Man., G. T. Varney. P	1871	48/-	64/9	94/3	18,910,748
Co-operative Insurance Society Ltd., 109, Corporation Street, Manchester. Man., J. P. Jones M	1867	47/4	63/1	90/1	5,907,811
Eagle Star & British Dominions Insurance Co. Ltd., 1, Threadneedle St. E.C.2.; Life Dept., 32, Moorgate, E.C.2. Man. Dir., Sir Edward M. Mountain, Bart., J.P. P	1807	48/1	63/10	89/5	14,406,143
Equitable Life Assurance Society, 19, Coleman Street, E.C.2. Act. and Man., W. Palin Elderton M	1762	54/-	68/-	92/-	8,091,365
Equity & Law Life Assurance Society, 18, Lincoln's Inn Fields, W.C. Man. and Sec., A. C. Thorne. F.I.A. P	1844	48/10	64/6	90/9	10,656,055

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Friends' Provident & Century Life Office, 7, Leadenhall Street, E.C.3, and 13, Charlotte Square, Edinburgh.2. Gen. Man., Henry J. Tapscott. Act. and Sec., Alfred Moorhouse, F.I.A. .. M	1832	48/-	64/3	89/9	7,307,328
General Life Assurance Company, General Buildings, Aldwych, W.C.2. Gen. Man., S. Norie-Miller P	1837	49/2	64/11	91/3	2,995,198
Gresham Life Assurance Society Ltd., 188-190, Fleet St., E.C.4. Gen. Man., Alex. Lawson .. P	1848	47/6	62/10	88/6	8,780,178
Guardian Assurance Co. Ltd., 68, King William St., and 21, Fleet Street, E.C. Gen. Man., A. G. Sweet, Act. and Sec., W. A. Osborne .. P	1821	48/10	64/6	89/3	6,785,502
Law Union and Rock Insurance Co. Ltd., 7, Chancery Lane, W.C. Sec., A. H. Shrewsbury .. P	1806	48/4	64/-	89/10	10,790,832
Legal & General Assurance Society Ltd., 10, Fleet St., E.C. Gen. Man., W. A. Workman, F.I.A. P	1836	—	—	—	21,996,441
Life Association of Scotland, 82, Princes St., Edinburgh.2. Man. and Act., R. M. M. Roddick. Sec., A. G. R. Brown, London, 28, Bishopsgate, E.C.2. 1838	48/11	64/10	91/1	7,195,881	
Liverpool and London and Globe Insurance Co. Ltd., 1, Dale Street, Liverpool.2. Gen. Mans., F. J. Williams and J. Dyer Simpson. London Office, 1, Cornhill, E.C.3. P	1836	49/10	65/9	91/3	10,661,440
London & Scottish Assurance Corporation Ltd., King William Street House, Arthur Street, E.C.4. Man., Frank B. Cooke. Sec., A. G. H. Emslie. P	1862	48/9	64/9	91/2	4,908,834
London Assurance, The, 1, King William St., E.C. Act. and Life Man., A. G. Paton, F.I.A. .. P	1720	49/-	64/8	90/2	7,123,372
London Life Association Ltd., 81, King William St., E.C.4. Act. and Man., A. W. Evans, F.I.A. M	1806	45/3	59/-	82/-	23,531,215
Marine and General Mutual Life Assurance Society, 48, Fenchurch Street, E.C.3. Act. and Sec., Howard T. Cross, F.I.A. M	1852	48/10	65/-	91/6	3,516,992
Medical Sickness Annuity & Life Assurance Society, Ltd., 300, High Holborn, W.C. Man. and Sec., Bertram Sutton, F.C.I.I. M	1884	40/2	55/3	80/-	382,294
Mutual Life and Citizens' Assurance Co. Ltd. (of Australia), Brettenham Ho., 1, Lancaster Place, W.C.2. Man., Alex. S. Sellar, M.A., F.F.A. P	1886	48/9	65/3	89/9	18,984,887
National Mutual Life Assurance Society, 39, King St., Cheapside, E.C.2. Act. and Man., G. H. Recknell, F.I.A., F.F.A. M	1830	48/4	63/7	89/6	5,460,135
National Mutual Life Association of Australasia, Ltd., 5, Cheapside, E.C.2. Man., J. T. Campbell M	1869	46/8	61/6	87/2	35,000,000
National Provident Institution, 48, Gracechurch St., E.C.3. Act. and Sec., H. E. Melville, F.I.A. M	1835	50/2	66/3	91/1	10,917,996
North British & Mercantile Insurance Co. Ltd., 61, Threadneedle St., E.C.2 and 64, Princes St., Edinburgh. Man. Dir., London, Sir A. Worley, Bt., C.B.E. Man., Edinburgh, J. E. Bell. .. P	1809	49/10	66/1	91/11	32,880,610
Northern Assurance Co. Ltd., 1, Moorgate, E.C.2. Gen. Man., K. K. Peters. P	1836	49/-	64/8	90/10	7,144,190
Norwich Union Life Insurance Society, Norwich. Gen. Man. and Act., H. G. Wilton, F.I.A. London, 49, Fleet St., E.C.4. Further particulars see page 14 M	1808	51/9	66/6	92/5	36,607,864
Pearl Assurance Co. Ltd., 252, High Holborn, W.C.1. Joint Man. Dir.s., J. Pierce and H. H. Austin, F.I.A. P	1864	49/-	65/-	92/-	63,911,669
Phoenix Assurance Co. Ltd., Phoenix House, King William St., E.C., 7, St. James's Street, S.W.1, and 187, Fleet Street, E.C.4. Gen. Man., R. Y. Sketch. Further particulars see page xlvii P	1782	48/10	64/4	89/1	16,002,786

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† Includes Guarantee Fund.

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Provident Mutual Life Assurance Association, 25 to 31, Moorgate, E.C.2. <i>Man. and Act.</i> , C. R. V. Coutts, F.I.A. M	1840	48/8	64/8	90/4	8,569,412
Prudential Assurance Co. Ltd., Holborn Bars, E.C.1. <i>Gen. Man.</i> , Sir Joseph Burn, K.B.E., F.I.A. P	1848	47/-	64/6	91/2	241,728,462
Refuge Assurance Co. Ltd., Oxford Street, Manchester. <i>Man. Dir.</i> , J. Proctor Green. <i>Gen. Man.</i> , S. G. Leigh, F.I.A., London, 133, Strand, W.C. P	1864	49/3	65/9	91/9	52,132,523
Royal Exchange Assurance, Royal Exchange, E.C.3, and 44, Pall Mall, S.W.1. <i>Act.</i> , T. F. Anderson, F.I.A., F.F.A. P	1720	49/-	64/9	90/2	10,521,527
Royal Insurance Co. Ltd., 1, North John St., Liverpool. <i>Gen. Mans.</i> , F. J. Williams and J. D. Simpson. London Offices, 24-28, Lombard St., E.C.3. <i>London Man.</i> , F. R. Bellamy P	1845	48/-	64/8	90/-	24,529,238
Royal London Mutual Insurance Society Ltd., Finsbury Sq., E.C.2. <i>Chairman and Man. Dir.</i> , Alfred Skeggs, F.G.I.I. <i>Sec.</i> , J. J. Pipe. <i>Act.</i> , J. H. Duffell, F.I.A. M	1861	46/8	63/9	91/7	27,153,025
Scottish Amicable Life Assurance Society, St. Vincent Place, Glasgow. <i>Man. and Act.</i> , R. Gordon-Smith. <i>Sec.</i> , R. Jeffrey. London, 17, Tokenhouse Yard, E.C.2. <i>Sec.</i> , F. K. Fenton M	1826	50/1	65/9	90/6	10,781,608
Scottish Equitable Life Assurance Society, 28, St. Andrew Square, Edinburgh. <i>Man. and Act.</i> , C. Guthrie. <i>Secs.</i> , W. R. McIlvenna, and A. C. Murray. London Office, 13, Cornhill, E.C.3. <i>Sec.</i> , W. S. King M	1831	50/-	65/6	90/6	10,047,749
Scottish Life Assurance Co. Ltd., 19, St. Andrew Sq., Edinburgh. <i>Gen. Man.</i> , Lewis P. Orr, F.F.A., F.R.S.E. London Office, 9, King St., E.C.2. <i>Man.</i> , Jas. A. Hay P	1831	49/5	64/6	90/5	6,950,436
Scottish Provident Institution, 6, St. Andrew Square, Edinburgh. <i>Man.</i> , Sir Robert T. Boothby, K.B.E. <i>Joint Secs.</i> , A. Graham Donald and C. S. Willis. <i>Act.</i> , J. R. Armstrong. London Offices, 3, Lombard St., E.C.3, 52, Lime St., E.C.3, 56, Chancery Lane, W.C.2, and 17, Pall Mall, S.W.1. M	1837	36/7	51/-	75/3	23,762,898
Scottish Temperance & General Assurance Co. Ltd., 109, St. Vincent St., Glasgow. <i>Man.</i> , Wm. Bannatyne, F.F.A. London, 2, 3 & 4, Cheapside. <i>Man.</i> , C. S. McDonald. (<i>Less 10 per cent to Abstainers</i>) M	1883	48/6	63/9	89/10	6,928,760
Scottish Union & National Insurance Co., 35, St. Andrew Square, Edinburgh, 2. <i>Gen. Man.</i> , James G. Nicoll. London Office, 5, Walbrook, E.C.4. <i>Sec.</i> , H. F. Kirrage P	1824	50/-	65/8	92/-	11,115,795
Scottish Widows' Fund & Life Assurance Society, 9, St. Andrew Square, Edinburgh. <i>Man. and Act.</i> , H. G. Sharp, F.F.A., F.I.A. <i>Dep. Man. and Sec.</i> , E. V. Townshend. London Offices, 52, Bishopsgate, E.C.2, and West End Office, 17, Waterloo Place, S.W.1. <i>Further particulars see page lviii</i> .. M	1815	49/4	65/1	91/-	30,071,766
Southern Life Association, Bush House, Aldwych, W.C.2. <i>Man.</i> , Thos. Darling M	1891	46/8	61/6	87/2	5,830,457
Standard Life Assurance Co., 3, George Street, Edinburgh. <i>Man.</i> , S. E. Macnaghten. London Offices, 46, Queen Victoria St., E.C., <i>Sec.</i> , A. B. Drayton, and 15a, Pall Mall, S.W.1., <i>Sec.</i> , E. V. Goodall M	1825	48/5	64/4	90/1	23,516,606
Sun Life Assurance Co. of Canada, 2, 3, & 4, Cockspur Street, S.W.1. <i>Gen. Man.</i> , H. O. Leach. <i>Further particulars see opposite page</i> .. P	1865	48/5	65/4	94/2	119,708,710

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Sun Life Assurance Society, 63, Threadneedle Street, E.C.2. Gen. Man., Sec., and Act., R. G. Salmon, F.I.A. Joint Sec., G. M. Searle, F.I.A. Joint Act., J. Rietchel, F.I.A. P	1810	49/2	66/6	94/2	34,083,107
United Kingdom Provident Institution, 196, Strand, W.C.2. Sec. and Act., W. G. Barrett . . . M	1840	48/2	64/2	89/8	20,286,180
University Life Assurance Society, 25, Pall Mall, S.W.1. Act. and Sec., J. I. Gopp, F.I.A. . . P	1825	52/-	68/-	94/-	1,367,269
Wesleyan & General Assurance Society, Life, House Purchase, Annuities, Fire and General Business, Assurance Buildings, Steelhouse Lane, Birmingham. Man. Director, A. L. Hunt. Further particulars see page 17 M	1841	49/-	65/7	91/9	11,007,447
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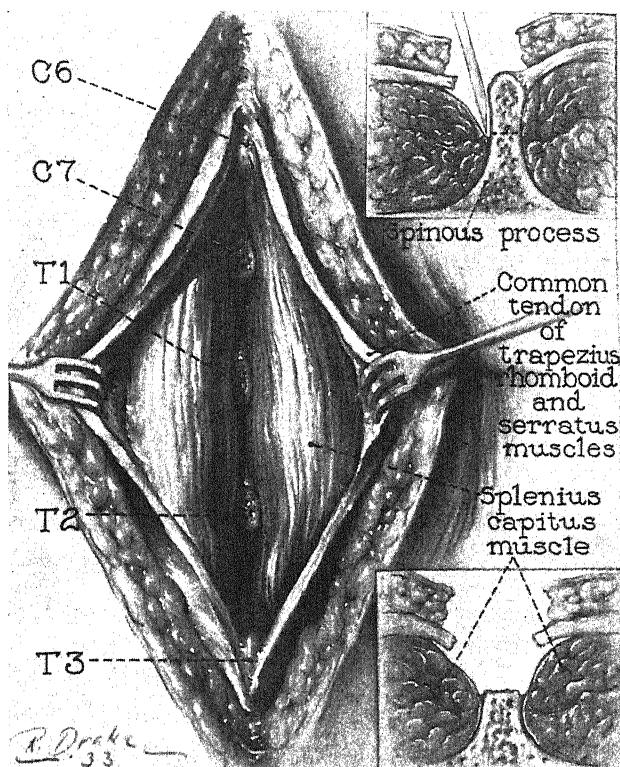
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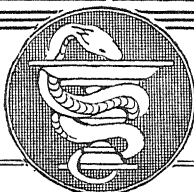
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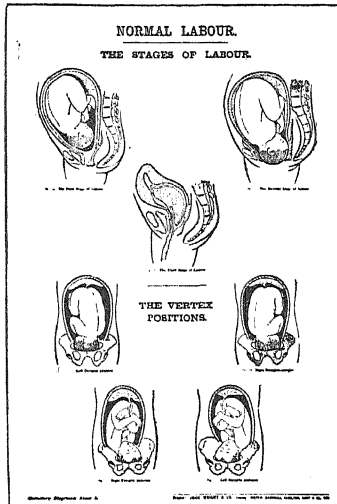
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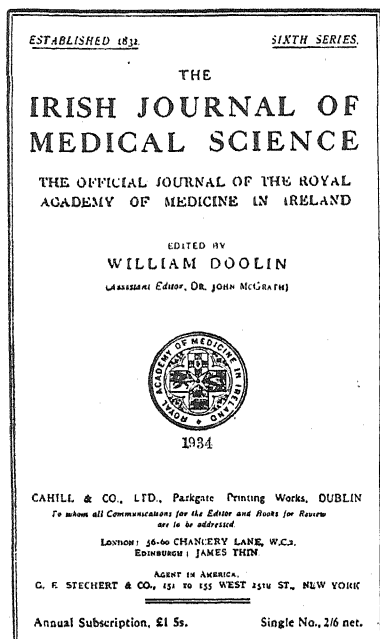
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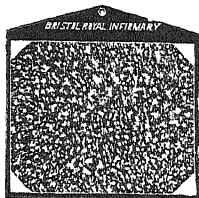
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5,937 In-Patients, and 325,776 Out-Patient Attendances Annually.

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Recognised by the Examining Board of the Royal College of Physicians and Surgeons as a place of study during the Fifth Year of the Medical Curriculum. Thirty Special Departments are maintained. Re-equipped Light and X-ray Departments. Maternity Department, Contributory Wards, General Wards, St. David's Wing with 66 beds for private patients, in private rooms, with separate Operating Theatres for the Wing, private Sitting Rooms and Sun Rooms.

Royal Chest Hospital, City Road, E.C.1. - - - **85 Beds**

For treatment of all Diseases of the Heart and Chest (Cases of Tuberculosis are admitted for diagnosis only).

Grovelands Hospital (Recovery), Southgate, N.14. - - - **60 Beds**

For reception of patients from above Hospitals.

Reckitt Convalescent Home, Clacton-on-Sea - - - **35 Beds**

**Maternity Nursing Association, Myddelton Square, E.C.1,
and 235 Camden Road, N.7.** - - - **466 Beds**

For District Midwifery work with Ante-Natal and Infant Welfare Clinics.

FUNDS ARE URGENTLY NEEDED.

Post Graduate Instruction

Special Courses are held in Medical and Surgical and special subjects, and are open to all medical practitioners free of charge. The Lectures are advertised beforehand in the Medical Journals.

Special Courses in Anaesthetics

3 Months—3 Guineas; 6 Months—4 Guineas.

Clinical Assistantships are available in all departments of the Hospital. Clinical Clerkships and Pathological Clerkships for a period of 3 months are available. **Fees—2 Guineas.**

School for Radiographers

Courses lasting 12 to 15 months commence in April and October for the training of Radiographers.

Further particulars may be obtained from:

Fees—25-30 Guineas.

Gilbert G. Panter, Secretary, Royal Northern Hospital, Holloway, N.7.

The Royal Dental Hospital of London SCHOOL of DENTAL SURGERY *(University of London)*

LEICESTER SQUARE, LONDON, W.C. 2.

Students are admitted for the curriculum for the B.D.S. Degree, and the L.D.S. Diploma in October, January and May.

HOSPITAL PRACTICE. The School is furnished with modern equipment, and the Clinic of the Hospital is unrivalled. Students may attend the operations in the In-Patient Department, and chair-side instruction is given in Advanced Operative Technique and Orthodontics.

DENTAL PROSTHETICS. The Mechanical Laboratory is a spacious and fully equipped department, under the direction of the Lecturer in Prosthetics.

HOUSE APPOINTMENTS. Six Senior House Surgeons and eighteen ordinary House Surgeons are appointed every year.

POST-GRADUATE INSTRUCTION. Instruction can be arranged in all branches of Dental Surgery.

Write for further particulars and School Calendar to **THE DEAN.**

LONDON FEVER HOSPITAL

FOUNDED 1802.

ISLINGTON, N.I.

The only Hospital of its kind in or around London which is NOT RATE SUPPORTED.

DISEASES TREATED are SCARLET FEVER, DIPHTHERIA, MEASLES and GERMAN MEASLES in the GENERAL WARDS, these and other INFECTIOUS DISEASES in PRIVATE ROOMS.

General Ward Fees—Children, 2 guineas; Adults, 3 guineas per week.

Private Rooms—7 and 10 guineas per week.

AMBULANCE sent on receipt of Telephone message (CLERKENWELL 9786).

Secretary - W. ELLIOT DIXON.

Central London Throat, Nose, and Ear Hospital

GRAY'S INN ROAD, LONDON, W.C.1

(Close to King's Cross Stations).

OUT-PATIENT CLINICS are held daily, during which special attention is given to the instruction of Post-Graduate Students.

CLINICAL ASSISTANTSHIPS are tenable for periods of three, six or twelve months, and Clinical Assistants are expected to attend at least two clinics a week, when a table is reserved for them in the Out-Patient Department for the examination of patients. These appointments afford the best method of obtaining a satisfactory knowledge of the Speciality.

Arrangements can always be made to suit the individual requirements of those in general practice who may be unable to attend regularly.

WEEKLY LECTURES by members of Hon. Medical Staff—Fridays, 4 p.m.
COURSES IN METHODS OF EXAMINATION AND DIAGNOSIS are given at frequent intervals.

SPECIAL INTENSIVE COURSES OF LECTURES AND DEMONSTRATIONS are given twice yearly, in May and October. This course includes Operative Surgery, Anatomy and Physiology, Peroral Endoscopy, and Pathology and Bacteriology Classes, and is especially suitable for Students intending to take the Diploma in Laryngology and Otology of the Conjoint Examining Board (D.L.O., R.C.P. & S. Eng.). A full syllabus of the routine work and of the Intensive Courses may be obtained from the Dean or the Secretary-Superintendent.

University of St. Andrews

(SCOTLAND).

Chancellor—The Rt. Hon. STANLEY BALDWIN, M.P., P.C., LL.D.

Rector—General the Rt. Hon. J. C. SMUTS, P.C., C.H., K.C., F.R.S.

Vice-Chancellor and Principal—Sir JAMES COLQUHOUN IRVINE, C.B.E., D.Sc., LL.D., Sc.D., D.C.L., F.R.S.

FACULTY OF MEDICINE

(Dean—F. J. CHARTERIS, M.D.)

The University confers the following **DEGREES AND DIPLOMAS**—M.B., Ch.B., M.D., Ch.M., Ph.D., D.P.H., L.D.S., D.P.D. (all open to men or women).

SESSION 1933-1934 opened 3rd October, 1933. The whole curriculum may be taken at Dundee, or the first two years may be taken in St. Andrews, the remaining three in Dundee.

CLINICAL INSTRUCTION at Dundee Royal Infirmary, and other Medical and Surgical Institutions in Dundee.

BURSARY (Scholarship) Competitions. June annually. Entries due 7th May.

RESIDENTIAL ENTRANCE SCHOLARSHIPS FOR MEN. Five or six of £100 competed for in June. Medical Students are eligible.

FEES for complete M.B., Ch.B. Course, exclusive of Examination Fees, Hospital Fees, etc., £182. Fees for L.D.S., £88 10s.; Fee for D.P.D., £25.

PRELIMINARY EXAMINATION. September and March. Entries due 8th August and 7th February.

RESIDENCE HALLS for Men and Women at St. Andrews; for Women at Dundee. Provision made for **POST-GRADUATE STUDY AND RESEARCH.**

Full information may be obtained from the **SECRETARY OF THE UNIVERSITY**, 71 North Street, St. Andrews; or, the **DEAN OF THE FACULTY OF MEDICINE**, Westlands, St. Andrews.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL AND MIDWIFERY TRAINING SCHOOL MARYLEBONE ROAD, N.W.1

Consulting Physician: H. MORLEY FLETCHER, M.D., F.R.C.P.

Consulting Obstetric Surgeons.

W. S. A. GRIFFITH, M.D., F.R.C.S., F.R.C.P.

T. W. EDEN, M.D., F.R.C.S., F.R.C.P., F.C.O.G.

A. F. STARR, M.B., M.R.C.S., F.R.C.P.

T. G. STEVENS, M.D., F.R.C.S., F.C.O.G.

J. BRIGHT BANISTER, M.D., F.R.C.S., F.C.O.G.

Consulting Surgeon—Sir T. CRISP ENGLISH, K.C.M.G., M.B., B.S., F.R.C.S.

Obstetric Surgeons to In-Patients.

ALECK W. BOURNE, M.B., B.C., F.R.C.S., F.C.O.G.

TREVOR B. DAVIES, M.D., B.S., F.R.C.S.

LOUIS C. RIVETT, M.A., M.C., F.R.C.S., M.C.O.G.

LEONARD G. PHILLIPS, M.S., M.B., F.R.C.S.

C. S. LANE ROBERTS, M.S., M.B., F.R.C.S., M.C.O.G.

LESLIE H. W. WILLIAMS, M.D., M.S., F.R.C.S., M.C.O.G.

Obstetric Surgeons to Out-Patients.

G. F. GIBBERD, M.B., B.S., F.R.C.S., M.C.O.G.

A. C. H. BELL, M.B., B.S., F.R.C.S., M.C.O.G.

Physician.

C. McMORAN WILSON, M.C., M.D., F.R.C.P.

Assistant Physician.

T. C. HUNT, D.M. OXON., M.R.C.P.

Pædiatrician.

G. ERIC C. PRITCHARD, M.D., F.R.C.P.

Surgeon.

C. H. S. FRANKAU, C.B.E., D.S.O., M.B., F.R.C.S.

Ophthalmic Surgeon.

F. A. JULER, M.B., F.R.C.S.

Dental Surgeon.

J. D. CAMBROOK, M.R.C.S., L.R.C.P.

Medical Officers' Ante-Natal Dept.

GERTRUDE DEARNLEY, M.D.

A. MORRIS JOHNS, M.D., CH.B.

EDITH M. HALL, M.D., F.R.C.S., M.C.O.G.

Medical Officer, Infant Consultation Centre.

A. A. MONCREIFF, M.R.C.S., M.R.C.P.

Hon. Director of Research Laboratories

and Consulting Bacteriologist.

LEONARD COLEBROOK, M.B., B.S.

Qualified Practitioners and Students are admitted to the Practice of this Hospital. There are 130 Beds, and about 2,700 Patients are received annually. In addition to the valuable routine work of the Hospital and Ante-Natal and Child Welfare Departments, unusual opportunities are afforded of seeing Obstetrical Complications and Operative Midwifery, more than one-half of the total admissions being primiparous cases. There are 30 beds at the Isolation Block and Research Laboratories at Hammersmith for cases of puerperal fever and puerperal pyrexia. Clinical Demonstrations are given by the Staff daily. Certificates awarded as required by the various Examining Bodies. The Residential College for Students is opposite the Hospital (with which it is in telephonic communication).

For Rules, Fees, &c., apply to H. B. STOKES, Secretary-Supt.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL

(UNIVERSITY OF LONDON)

DENMARK HILL, LONDON, S.E.5.

THE NEW BUILDINGS of the Medical School were opened by H.R.H. Prince George in July, 1933.

THE HALL OF RESIDENCE is near to the School.

THE ATHLETIC GROUND is within 10 minutes' walk of the Hospital.

FOURTEEN ENTRANCE SCHOLARSHIPS, total value of £1,530, are awarded annually.

DENTAL SCHOOL. A full Dental Course is given at King's Coll. Hospital and King's College.

The Calendar, Details of Scholarships, etc., will be sent on application to the DEAN, J. A. DRAKE, M.D., F.R.C.P., D.P.H.; or to the Secretary, S. C. RANNER, M.A., King's College Hospital Medical School, Denmark Hill, London, S.E.5.

QUEEN MARY'S HOSPITAL FOR THE EAST END

(Founded 1861; Incorporated by Royal Charter, 1917).

STRATFORD, LONDON, E.15

Patron: HER MAJESTY THE QUEEN.

President: HIS ROYAL HIGHNESS THE DUKE OF GLOUCESTER, K.G.

Deputy President: Sir LEONARD LYLE, Bt., J.P. Chairman: T. MAY-SMITH, Esq., J.P.

Secretary: MAJOR RAPHAEL JACKSON.

THE POOREST OF THE POOR are treated at this Hospital. Normal Accommodation, 219 Beds. Cost of Endowing a Bed, £1000; a Cot, £500. Funds most urgently needed to meet current expenditure, and will be gratefully received by W. A. VERNON, Esq., Hon. Treasurer, Hawkwell Place, Pembury, Kent, or by the Secretary.

In-Patients treated, 1932	.. 3,671	Out-Patient Attendances, 1932	.. 157,148
Accidents treated, 1932	.. 18,967	Ordinary Expenditure, 1932	£47,245
Income from Annual Subscriptions and Invested Property		..	£6,261/10/11

RAPHAEL JACKSON (Major), Secretary.

UNIVERSITY OF BRISTOL.

FACULTY OF MEDICINE.

THE University affords complete courses of instruction for its own examinations, those of the University of London, and those of the Conjoint Board, etc., for Medical Degrees or Diplomas, save the D.P.H. The Dental Department affords the necessary instruction for the Degrees and Diploma of the University and of other examining bodies in that subject.

The University confers the following Degrees and Diplomas :

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY	M.B., Ch.B.
MASTER OF SURGERY	Ch.M.
DOCTOR OF MEDICINE	M.D.
DOCTOR OF PHILOSOPHY	Ph.D.
BACHELOR OF DENTAL SURGERY	B.D.S.
MASTER OF DENTAL SURGERY	M.D.S.
DIPLOMA IN DENTAL SURGERY	L.D.S.
DIPLOMA IN PUBLIC HEALTH	D.P.H.

The early part of the curriculum so interlocks with the curriculum for the B.Sc. that the Medical student may without much loss of time take also the degree of B.Sc. The whole of the Dental Mechanical work for the Bristol Royal Infirmary and the Bristol General Hospital is done in the University laboratory by the students, instructed by skilled mechanics.

CLINICAL WORK is done at the Bristol Royal Infirmary and the Bristol General Hospital, which together contain 668 beds. The Bristol Royal Hospital for Sick Children and Women (100 beds), the Bristol Eye Hospital, the Bristol City and County Asylum, the Bristol City Fever Hospital and, by the kind permission of the Health Committee of the Bristol City Council, Southmead Infirmary are also open for the clinical instruction of students.

SCHOLARSHIPS.—There are Henry Herbert Wills Science Scholarships, and a Miriam Badock Entrance Scholarship, available to boys from Clifton College, which may be held in the Faculty of Medicine. Students from the City of Bristol may, on their merits, receive financial aid from the City Scholarship Fund on application to the Director of Education, Guildhall, Bristol. Forms of application must be returned to him by April 30th.

Several Scholarships and Prizes are open to students during their Hospital career.

HOSPITAL APPOINTMENTS open to students after qualification :—

At the Bristol Royal Infirmary.—Four House Surgeons, one Casualty House Surgeon, two House Physicians, one House Physician for Cancer Research Wards, one Resident Obstetric Officer, one Ophthalmic and Gynaecological House Surgeon; one Ear, Nose and Throat House Surgeon; one Assistant to the Senior Resident Medical Officer, who also acts as House Surgeon, and House Surgeon to the Skin Department; and one Dental House Surgeon.

At the Bristol General Hospital.—Senior Resident Medical Officer; one Casualty House Surgeon; two House Physicians; two House Surgeons; one Resident Obstetric Officer; one House Surgeon for Special Departments; one Dental House Surgeon. All these appointments are salaried, with board and residence.

For further particulars and prospectus apply to the DEAN of the Faculty of Medicine.

City of London Maternity Hospital and Midwifery Training School. CITY ROAD, E.C.1

Consulting Physician : R. A. YOUNG, Esq., C.B.E., M.D. (Lond.), F.R.C.P.

Consulting Surgeons : { SIR HUGH M. RIGBY, K.C.V.O., M.S. (Lond.), F.R.C.S.
R. J. McNEILL LOVE, Esq., F.R.C.S. (Eng.).

Consulting Obstetric Surgeons : { COMYNS BERKELEY, Esq., M.C., M.A., M.D., F.R.C.P.
EARDLEY HOLLAND, Esq., M.D. (Lond.), F.R.C.P., F.R.C.S.

Obstetric Surgeons :

W. McKIM H. McCULLAGH, Esq.,
D.S.O., M.C., B.A., M.B., F.R.C.S.
ARNOLD L. WALKER, Esq., M.A., M.B.,
B.Ch. (Cantab.), F.R.C.S., L.R.C.P.
R. CHRISTIE BROWN, Esq., M.S. (Durh.),
F.R.C.S.

Assistant Obstetric Surgeons :

R. L. DODDS, Esq., M.B., M.Ch.,
F.R.C.S. (Eng.).
J. V. O'SULLIVAN, Esq., M.D., M.R.C.P.
(Lond.), F.R.C.S. (Eng.).
J. B. BLAKLEY, Esq., M.B., B.S. (Lond.),
F.R.C.S. (Eng.).

Clinical Assistant to Child Welfare Centre : J. D. LEGGE CURRIE, Esq., M.R.C.S., L.R.C.P.

Resident Medical Officers : (TWO).

Physician to the Hospital :

SYDNEY A. OWEN, Esq., M.D., F.R.C.P.

Pathologist :

H. C. LUCEY, Esq., M.D., B.S. (Lond.),
D.P.H.

Anæsthetists :

HERBERT CHARLES, Esq., M.R.C.S.
(Eng.), L.R.C.P. (Lond.).
HUGH A. RICHARDS, Esq., M.A. (Camb.),
M.R.C.S. (Eng.), L.R.C.P. (Lond.).

Dental Surgeon :

DESMOND GURE, Esq., L.D.S., R.C.S.
(Eng.).

QUALIFIED PRACTITIONERS AND MEDICAL STUDENTS admitted to HOSPITAL PRACTICE.

PUPILS TRAINED AS MIDWIVES AND MONTHLY NURSES in accordance with Central Midwives Board Regulations. CERTIFICATES awarded as required by Examining Bodies.

PRIVATE WARDS for Paying Patients. Maternity Nurses available for Private Engagements.

Secretary : RALPH B. CANNINGS.

ROTUNDA HOSPITAL DUBLIN

UPWARDS of 2,000 maternity cases and 1,000 gynaecological intern patients are treated in the Hospital during the year. Besides the Hospital there is an extern Maternity Department with over 2,000 cases. The routine for Students consists of attendance at the Morning Lectures on Midwifery and Gynaecology, examination of patients in the Gynaecological Department, attendance at operations and all abnormal labour in the Hospital Wards, and conduction of labour cases in the intern and extern departments.

In addition there is a large Antenatal Clinic and an Infants' Department where students are encouraged to attend. The Pathological Laboratory is open to the Class, and the X-Ray plant adds greatly to the Hospital.

Qualified Students are given facilities for following and observing all abnormal cases in the hospital or district, and are allowed, so far as possible, to assist at gynaecological operations.

The Hospital Courses are always going on during the year, and Students can join at any time. The class is limited, therefore it is advisable to register in advance. Board and lodging can be obtained in the Hospital, where the living quarters are extremely comfortable.

Extra classes in gynaecological diagnosis and operative midwifery are conducted by the Assistants to the Master.

FEES : One month, £6 6s. ; months other than the first, £4 4s. Three months, £12 12s. L.M. Course, £21.

The L.M. Certificate is given to fully qualified Practitioners of Medicine on examination after six months' attendance at the Hospital.

FULL PARTICULARS FROM—

ANDREW HOPE DAVIDSON, M.D., F.R.C.P.I., Master, Rotunda Hospital.

... THE ...

UNIVERSITY OF LIVERPOOL

FACULTY OF MEDICINE.

The University grants degrees in Medicine, Surgery, Hygiene, Orthopaedic Surgery, Dental Surgery, and Veterinary Science, also degree of Doctor of Philosophy, and Diplomas in Public Health, Tropical Medicine, Tropical Hygiene, Veterinary Hygiene, Medical Radiology and Electrology, and a Licence in Dental Surgery. Students may also prepare in the University for the examinations of other licensing bodies.

Medical School Buildings.—The buildings of the Medical School are all modern, and contain spacious lecture rooms, and well-equipped laboratories and class-rooms for the study of all the more important subjects which form the basis of medicine. In addition, laboratories are provided for medical research in Biochemistry, Tropical Medicine, Physiology, Comparative Pathology, Pathology, Bacteriology, Hygiene, and Cytology.

Hospitals.—The Clinical School consists of four general hospitals—the Royal Infirmary, the David Lewis Northern Hospital, the Royal Southern Hospital, and the Stanley Hospital; and of five special hospitals: the Eye and Ear Infirmary, the Women's Hospital, Liverpool, the Royal Liverpool Children's Hospital, St. Paul's Eye Hospital, and Liverpool Maternity Hospital. These hospitals contain in all a total of over 1500 beds.

Fellowships and Scholarships.—Fellowships, Scholarships, and prizes of over £1500 are awarded annually. There are also numerous Entrance Scholarships. Particulars may be obtained on application.

*The following Prospectuses may be obtained on application to the Registrar:—*Medical Faculty, School of Tropical Medicine, School of Dental Surgery, School of Veterinary Science, and Diploma in Public Health.

W. H. WOOD, Dean.

SCHOOL OF MEDICINE

OF

The Royal Colleges, EDINBURGH.

(FOUNDED 1505.)

WINTER SESSION, 1933-34, opens 3rd OCTOBER.

SUMMER SESSION, 1934, opens 17th APRIL.

THE Lectures qualify for the English and Scottish Universities and other Medical Examining Boards.

One half of the Qualifying Classes required for graduation in the University of Edinburgh may be attended in this School.

The Calendar of the School, giving all necessary information regarding Classes, Fees, and Examinations, will be published on September 5th, price 9d. post free, on application to the—

DEAN OF THE SCHOOL, SURGEONS' HALL, EDINBURGH.

FELLOWSHIP of MEDICINE

1, WIMPOLE STREET, LONDON, W.1. - - LANGHAM 4266

Should be consulted regarding all Post-Graduate instruction.

Annual Membership Subscription (from month of joining), £1 1s.

SPECIAL COURSES in all subjects arranged periodically, including Courses for M.R.C.P. and F.R.C.S. (Final).		ROTA OF TEACHERS giving personal Tuition always available.
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The "POST-GRADUATE MEDICAL JOURNAL," giving full details, in addition to matter of Clinical and Practical interest, is published monthly.

UNIVERSITY OF BIRMINGHAM

FACULTY OF MEDICINE.

(Associated with the General, Queen's and Special Hospitals for Clinical Teaching.)

The University grants Degrees in Medicine, Surgery and Public Health, and a Diploma in Public Health; also Degrees and a Diploma in Dental Surgery.

The courses of instruction are also adapted to meet the requirements of other Universities and Licensing Bodies.

SCHOLARSHIPS, EXHIBITIONS AND PRIZES.

Entrance and other Scholarships and Exhibitions, and various Prizes and Medals are awarded annually in the Faculty of Medicine.

SCHOOL OF DENTISTRY

(University of Birmingham and Birmingham Dental Hospital.)

The School of Dentistry, in conjunction with the General and Queen's Hospitals, affords a complete curriculum for the Dental Diplomas and Dental Degrees of the University and all other Licensing Bodies. There is a Dental Scholarship of the value of £46 17 6 offered annually.

RESIDENCE FOR UNDERGRADUATES AND OTHER STUDENTS.

There are Halls of Residence for Men and for Women Students. A Register of approved lodgings is also kept by the Secretary of the University.

For Syllabus and further information apply to the REGISTRAR, or Dr. STANLEY BARNES, M.D., F.R.C.P., Dean.

THE WELSH NATIONAL SCHOOL OF MEDICINE (UNIVERSITY OF WALES).

THE Courses of Instruction are held for the Degrees in Medicine and Surgery (M.B., B.Ch.), of the University of Wales, and are open to both sexes. These Courses also comprise the instruction necessary for the Degrees and Diplomas of other Licensing Bodies.

Entrance Scholarships, &c., are available, and a special Prospectus relating to these is issued. Hospital Instruction is given at the Cardiff Royal Infirmary; the City Lodge Hospital, Cardiff; Cardiff City Mental Hospital, Whitchurch; the Cardiff City Sanatorium; the Gwyn Mabry and Ghan Ely Hospitals (Tuberculosis); and the Prince of Wales' Hospital (Orthopaedic), Cardiff.

Full facilities are available for every branch of study.

Complete Post Graduate Courses of Instruction are also held for the Diploma in Public Health, and for the Tuberculous Diseases Diploma of the University of Wales.

The Buildings of the School are equipped with modern facilities for research in every branch of Medicine and Surgery. Post-Graduate Scholarships are available ranging in value from £150 to £250 per annum.

PROSPECTUSES CAN BE OBTAINED ON APPLICATION TO THE SECRETARY.

WELSH NATIONAL SCHOOL OF MEDICINE, THE PARADE, CARDIFF.

The West End Hospital for Nervous Diseases

OUT-PATIENT DEPARTMENT - WELBECK STREET, W.1.

IN-PATIENT DEPARTMENT - GLOUCESTER GATE, REGENT'S PARK, N.W.1.

(Recognised by the University of London and the Conjoint Board.)

Special Week-end Short Concentrated Courses for General Practitioners are arranged in conjunction with the Fellowship of Medicine.

The General Practice of the Hospital is conducted daily (Saturdays excepted).

The Savill Prize (value £15) and Medal is offered biennially for the best thesis on a neurological subject submitted by Post-Graduates who have attended the Hospital practice on not less than 10 occasions.

A limited number of appointments as Hon. Clinical Assistants are open to Post-Graduates.

The Senior and Junior House Physicians are appointed every six months, with remuneration at the rate of £150 and £100 per annum respectively.

For particulars of the above apply to C. WORSTER-DROUGHT, M.D., M.R.C.P., Dean, or to the SECRETARY OF THE HOSPITAL, at 73, WELBECK STREET, W.1.

UNIVERSITY OF LONDON
OPHTHALMIC HOSPITAL MEDICAL SCHOOL
ROYAL LONDON OPHTHALMIC HOSPITAL
(Moorfields Eye Hospital), CITY ROAD, E.C.1.

Qualified Medical Practitioners and Registered Medical Students may enter on the practice of the Royal London Ophthalmic Hospital (Moorfields) at any time, and are on certain conditions eligible for appointment as Chief Clinical Assistant, Clinical Assistant, and Junior Assistant.

Courses of Instruction, extending over a period of five months, begin in OCTOBER and MARCH:

1. PRACTICAL REFRACTION CLASSES.
2. METHODS OF EXAMINATION AND USE OF THE OPHTHALMOSCOPE.
3. LECTURES every afternoon on the following subjects:—(a) ANATOMY, including EMBRYOLOGY AND NORMAL HISTOLOGY; (b) PHYSIOLOGY; (c) OPTICS including PHYSIOLOGICAL OPTICS; (d) PATHOLOGY AND BACTERIOLOGY; (e) OPHTHALMIC MEDICINE AND SURGERY, consisting of MEDICAL OPHTHALMOLOGY, EXTERNAL DISEASES OF THE EYE, MOTOR ANOMALIES AND SQUINT, DISEASES OF THE RETINA AND OPTIC NERVE, DISEASES OF THE UVEAL TRACT.
4. OPHTHALMOSCOPIC CONDITIONS: A Practical Class with Demonstrations each week at 5 P.M.
5. OCCASIONAL LECTURES on subjects allied to Ophthalmology.
6. OPERATIVE SURGERY. In these classes the usual operations are performed by the student upon pigs' eyes.
7. PRACTICAL PATHOLOGY. A Course of Demonstrations on the Normal and Morbid Histology of the Eye is given by the Pathologist in the Laboratory.
8. PRACTICAL BACTERIOLOGY.
9. CLASSES IN RADIOGRAPHY.
10. PHYSIC-THERAPY (ULTRA-VIOLET LIGHT DIATHERMY, ETC.).
11. SLIT-LAMP MICROSCOPY.

FEES.—A composition fee of 35 Guineas will admit Students at once to all the lectures and classes except the classes on Physico-Therapy, Slit-Lamp Microscopy, and the Examination Fee.

DIPLOMA IN OPHTHALMIC MEDICINE & SURGERY & OTHER DEGREES IN OPHTHALMOLOGY.

The above complete curriculum is specially designed to meet the requirements of candidates entering for these examinations.

FEES FOR THE PRACTICE OF THE HOSPITAL:

Perpetual - £5 5 0; Three to Six Months - £3 3 0; Two Months - £2 2 0; One Month - £1 1 0
Clinical work begins at 9 a.m. daily. Operations are performed between 10 a.m. and 1 p.m.
For further particulars apply to the SECRETARY to the Medical School, at the Royal London Ophthalmic Hospital, City Road, E.C.1; or to the Dean, CHARLES GOULDEN, O.B.E., M.D., M.Ch., F.R.C.S.

UNIVERSITY of ABERDEEN Founded 1494.
FACULTY OF MEDICINE.

THE Degrees in Medicine granted by the University are—Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, and Master of Surgery. The Degree of Ph.D. is also granted in this Faculty. They are conferred after Examination, and only on Students of the University. Women are admitted to instruction and graduation on the same footing as men. A Diploma in Public Health is conferred (after Examination) on Graduates in Medicine of the University of Aberdeen, or of any University whose medical degrees are recognized as qualifying for registration by the General Medical Council of the United Kingdom. The Faculty of Medicine embraces thirteen chairs, and instruction is given in all departments of Medical Science.

Practical Classes are conducted by the Professors, Lecturers, and Assistants in Laboratories furnished with all necessary appliances; and facilities are afforded to Students and Graduates to extend their practical knowledge and to engage in original research.

Instruction is also given in special departments of Medical Practice by Lecturers appointed by the University Court.

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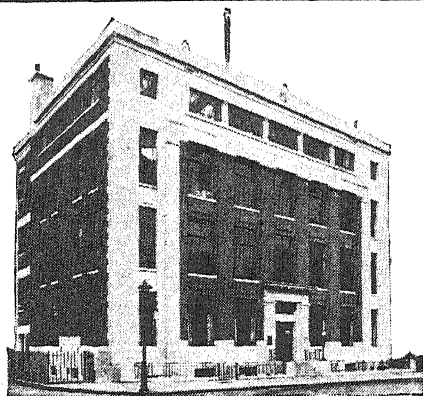
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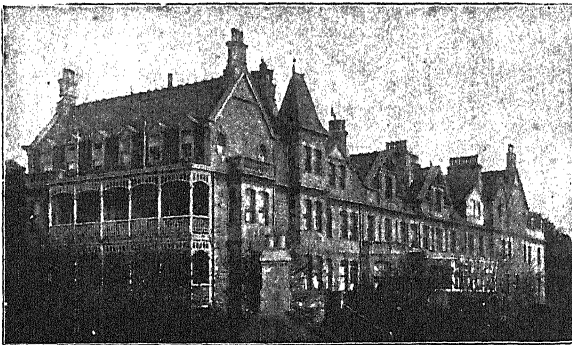
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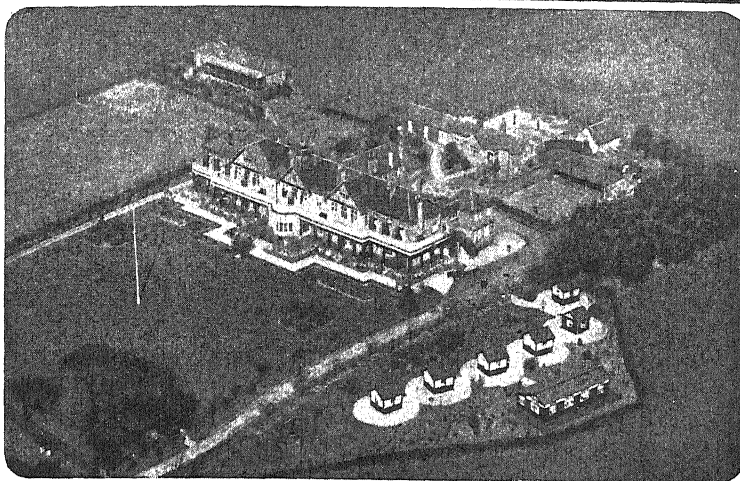
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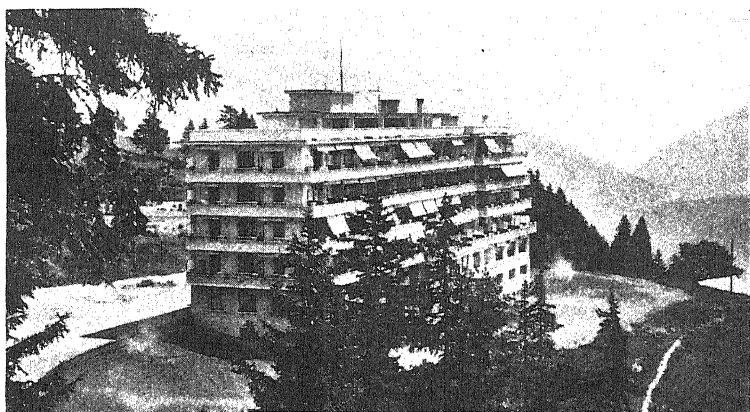
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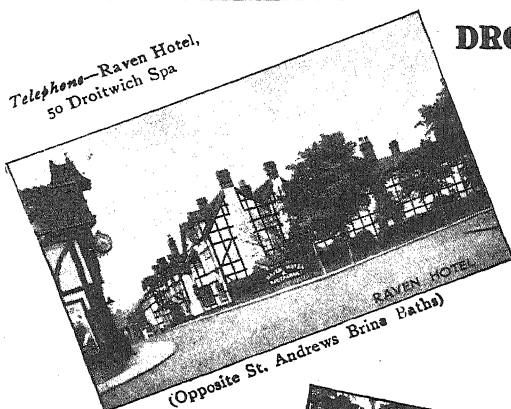
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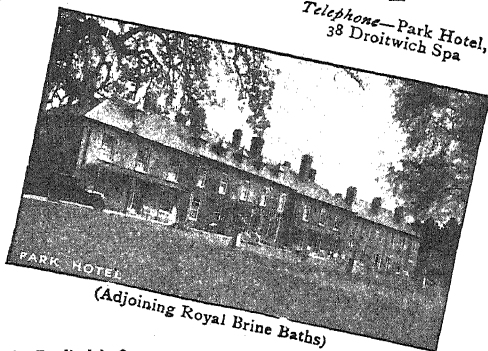
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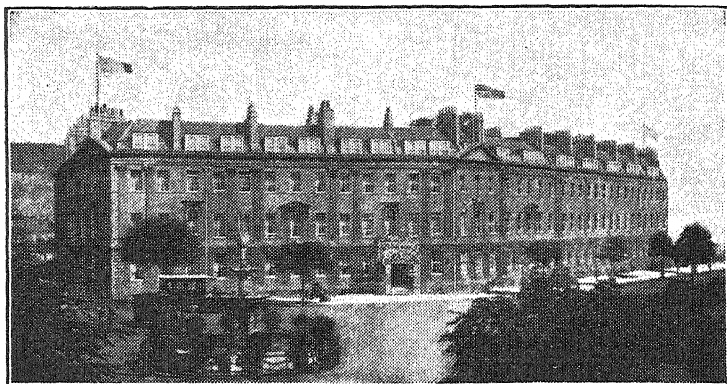
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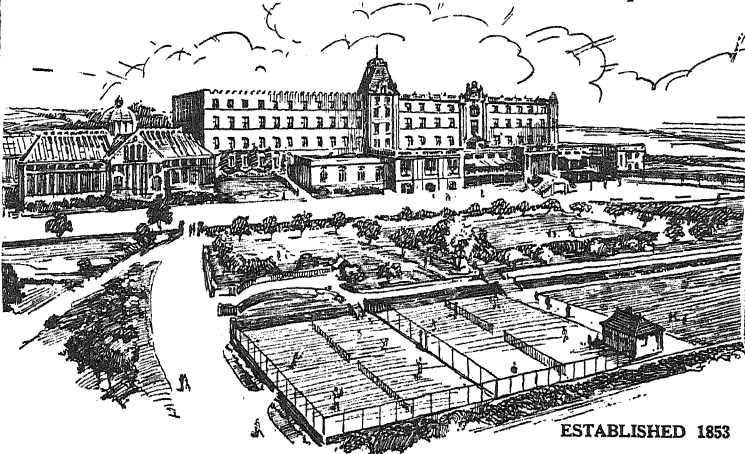
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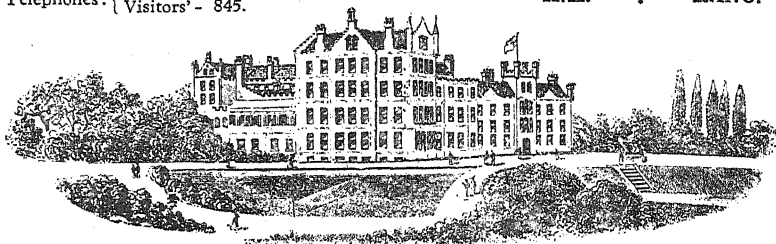
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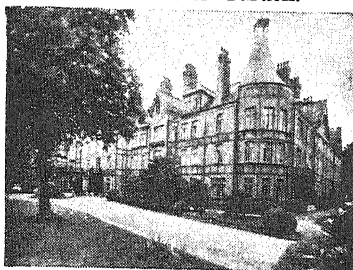
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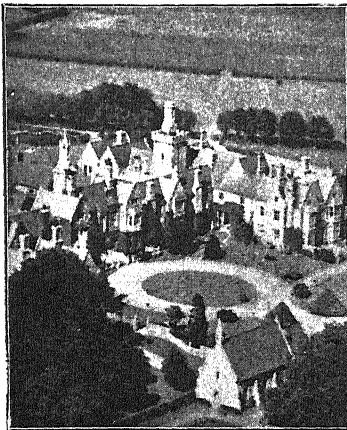
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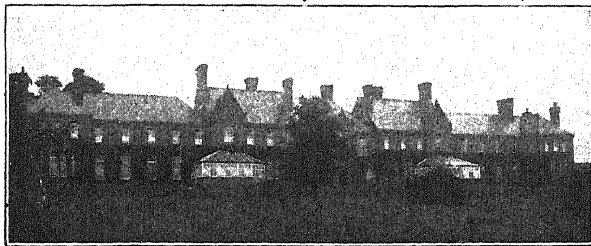
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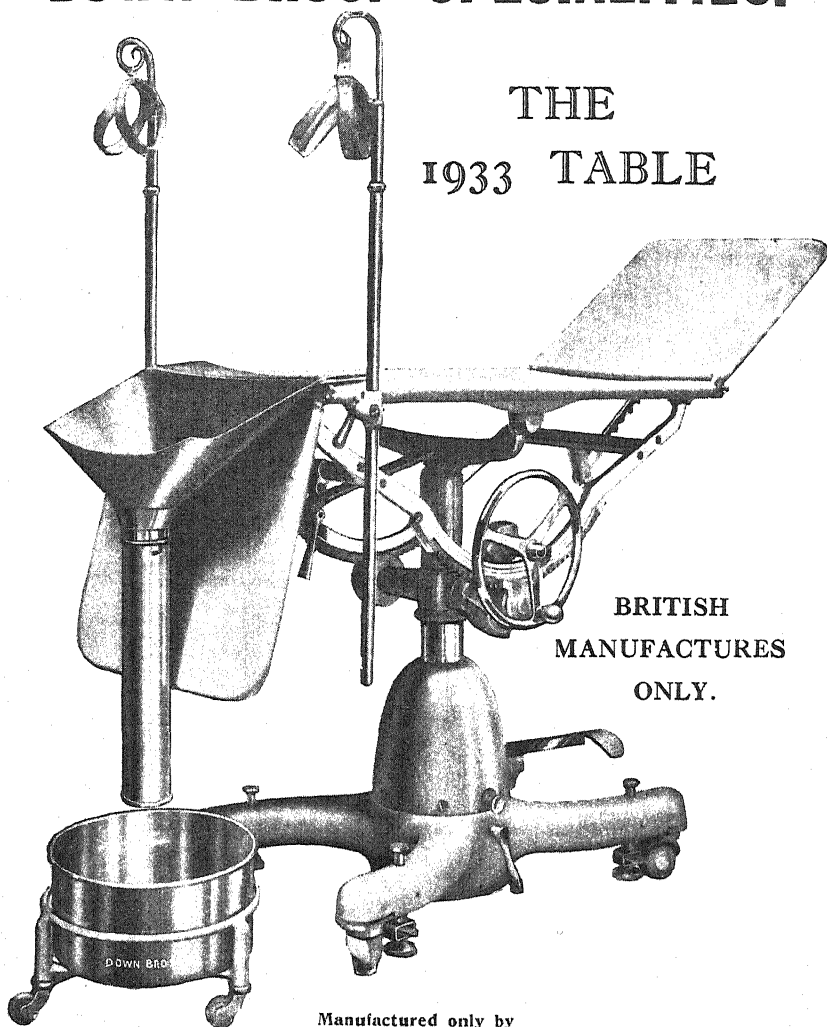
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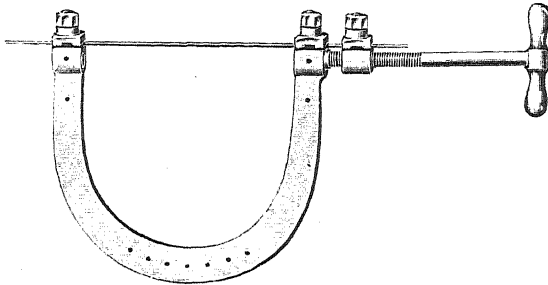
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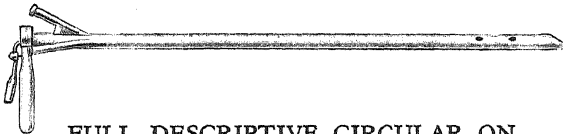
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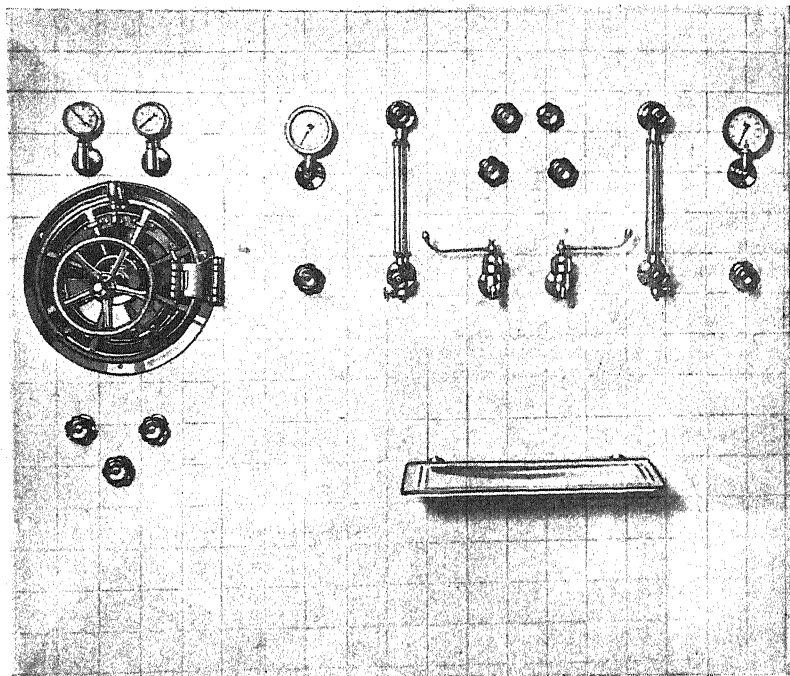
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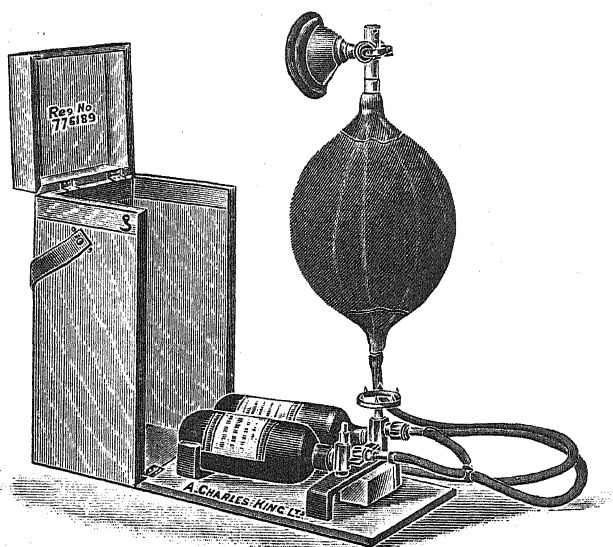
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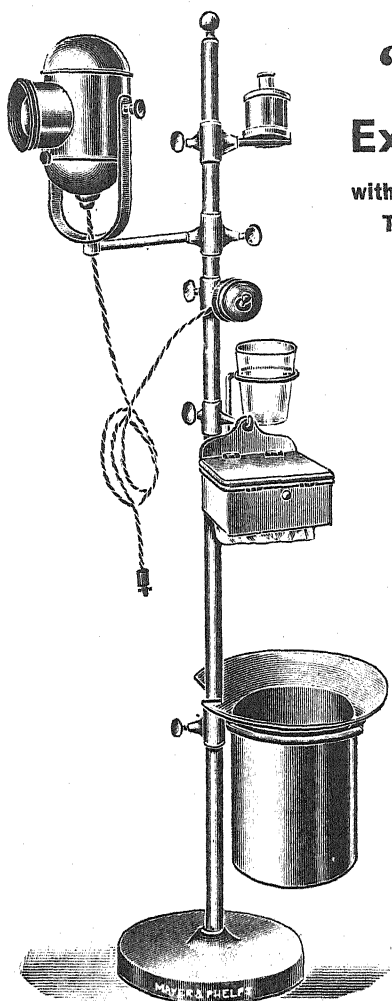
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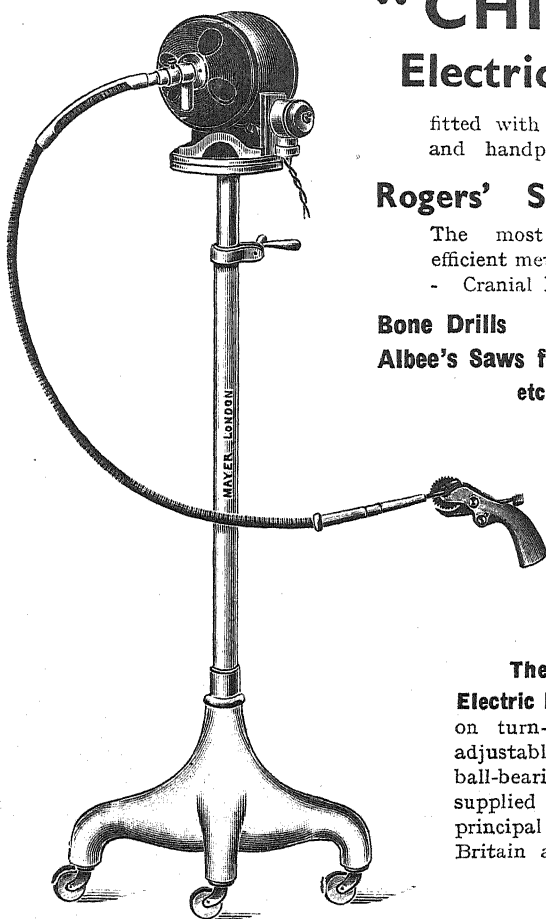
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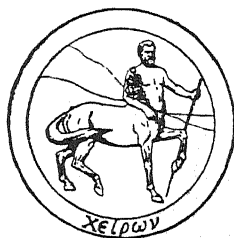
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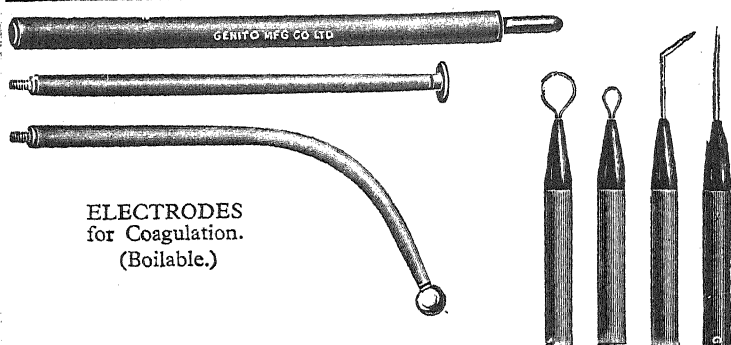
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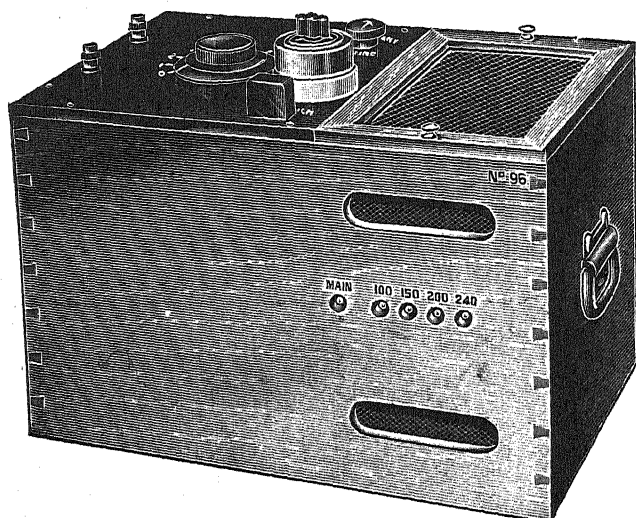
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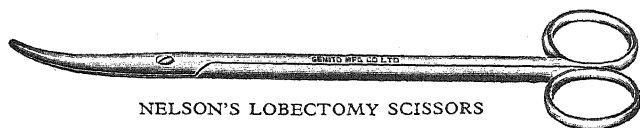
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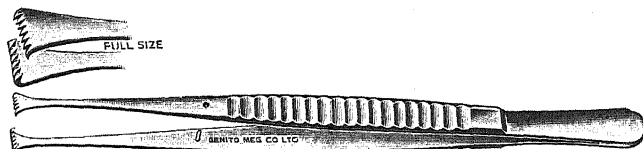
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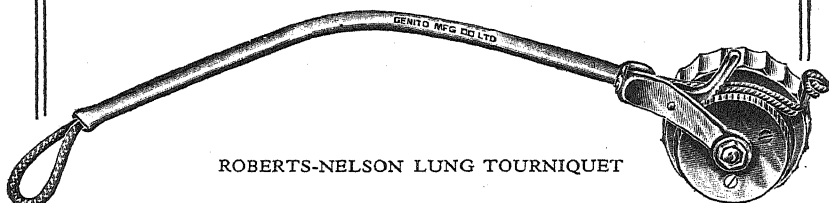
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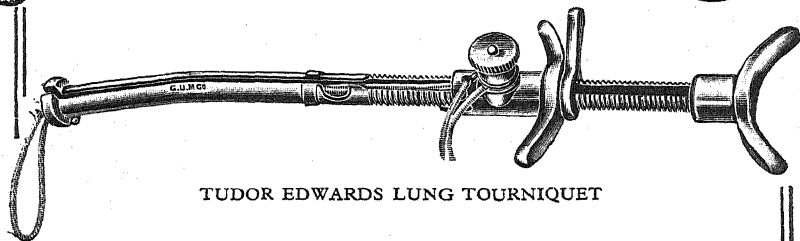
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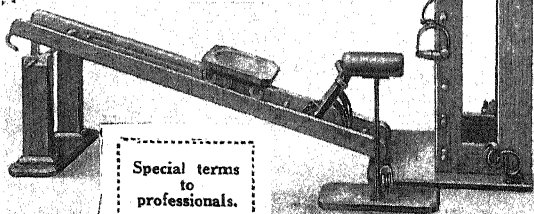
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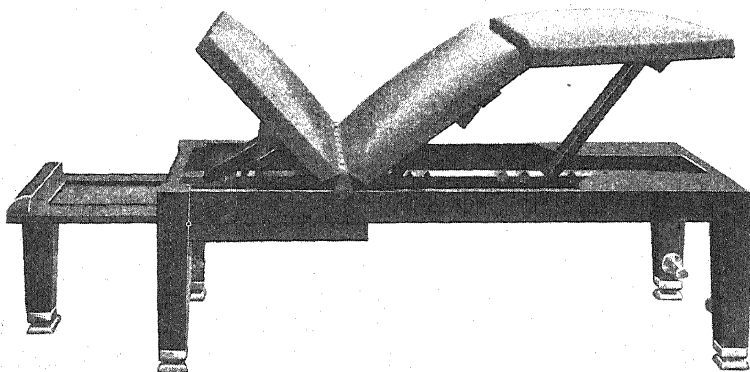
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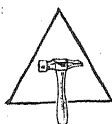
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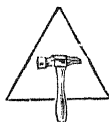
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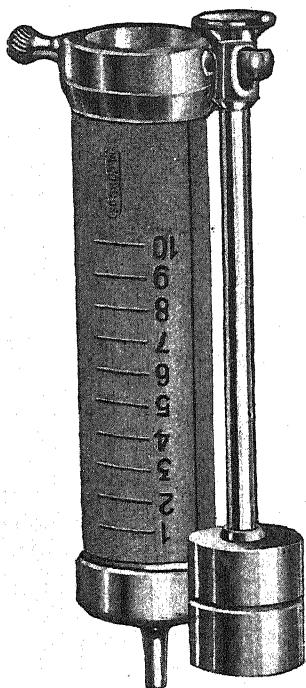
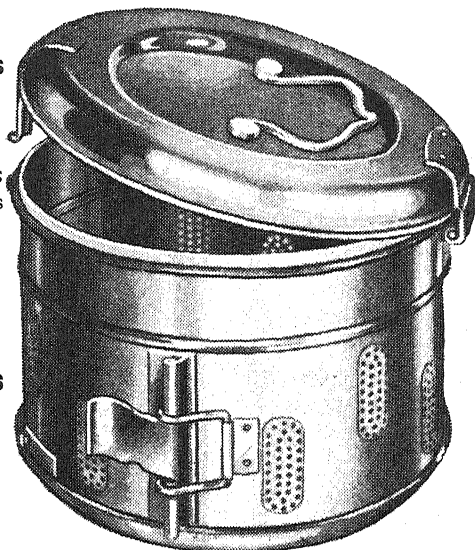
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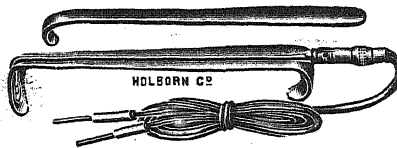


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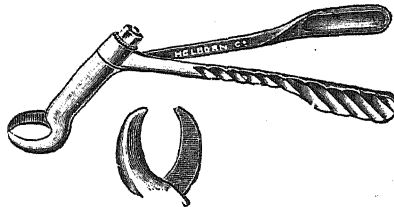
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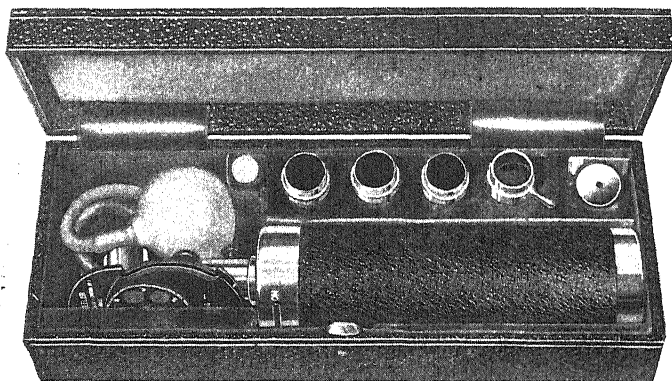
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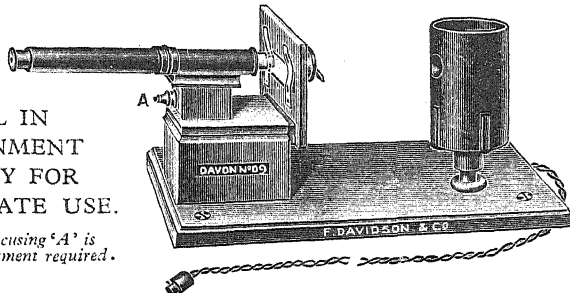
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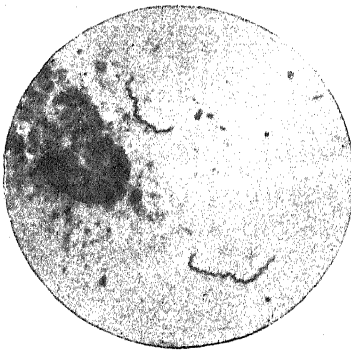
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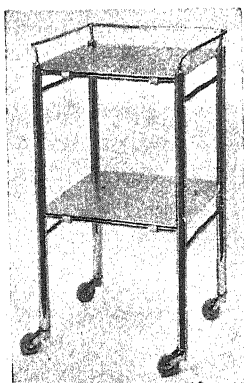
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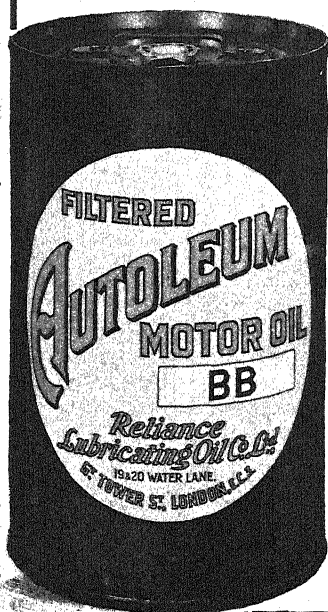
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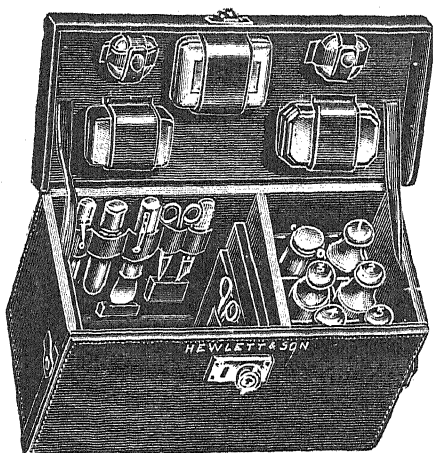
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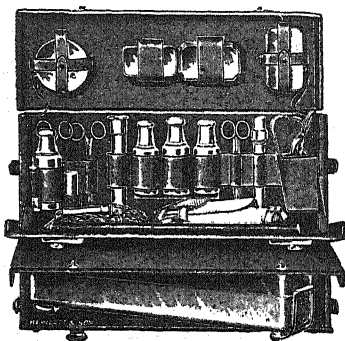
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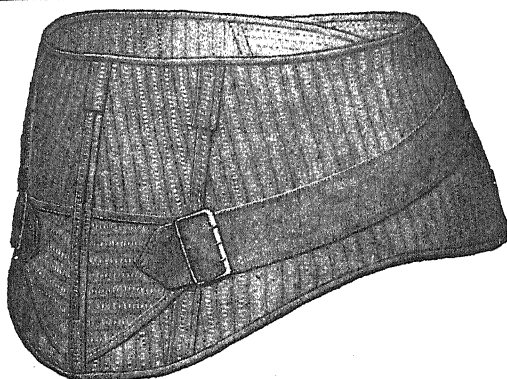
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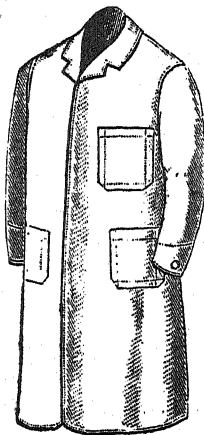
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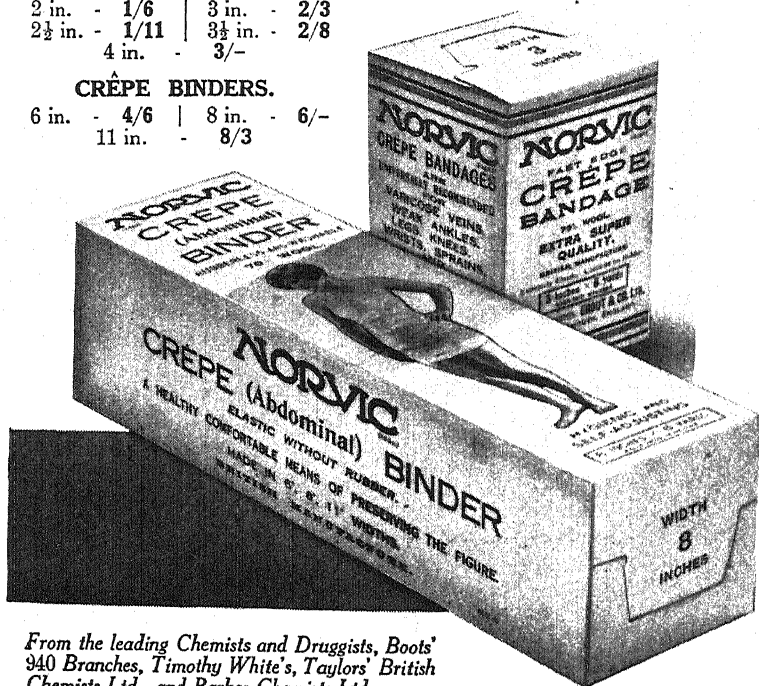
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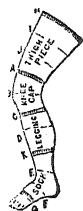
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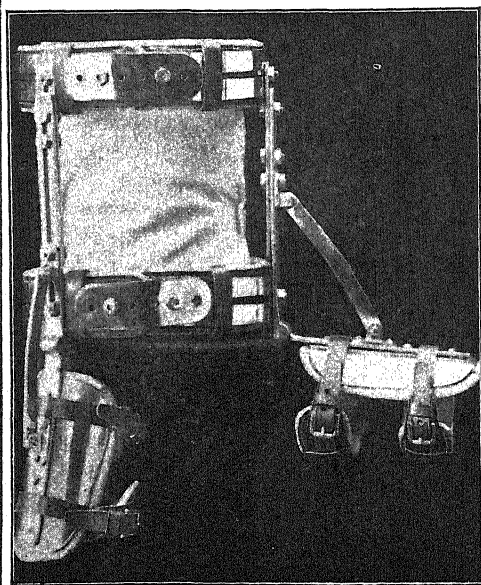
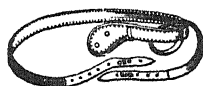
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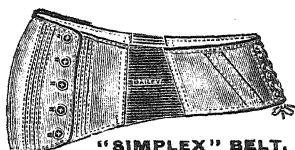
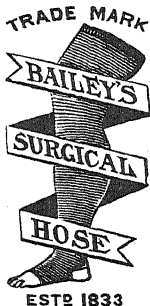
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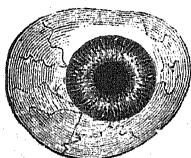


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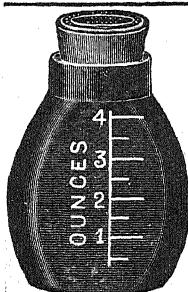


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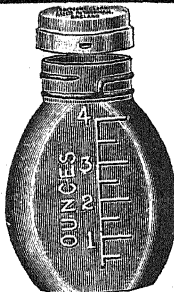
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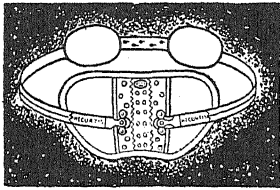
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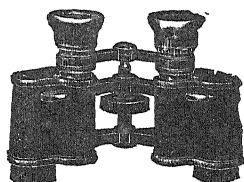
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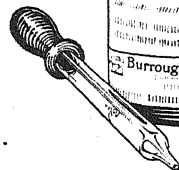
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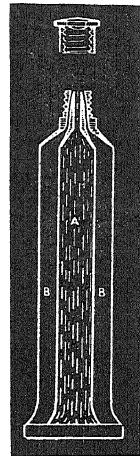
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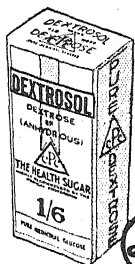
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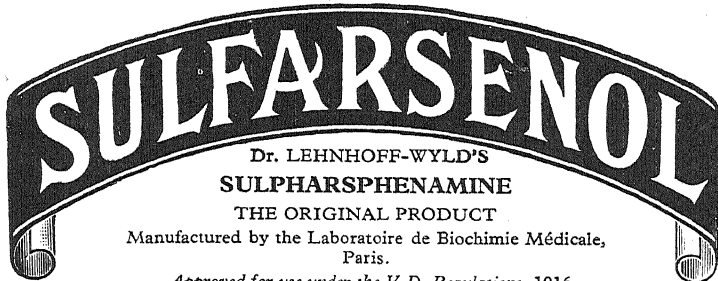
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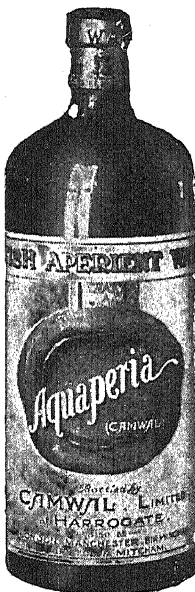
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